WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

catalogued

...Wildlife Research Unit,
...State University, Columbus, Ohio.

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Washington, D. C. No. 29 January, 1941

Classification: Birds

Wetmore, Alexander. A systematic classification of the birds of the world, Smithsonian Miscellaneous Collections (Smithsonian Institution, Washington, D. C.), 99(7), 11 pp., 1940.

Third edition of this check-list of families and superior groups used in the classification of birds, both fossil and recent.

Classification: Pocket gophers

Davis, Wm. B. Distribution and variation of pocket gophers (Genus Geomys) in the southwestern United States, Texas Agr. Expt. Sta. (College Station) Bul. 590, 38 pp., 6 figs., 4 tables, 1940.

A treatment of 4 species and 20 subspecies, ten of the latter being described as new. Keys and descriptions, statements of range and characteristics, and measurements, comparisons, and remarks, are included. Gophers of this genus live in sandy soils, and their races are more or less isolated by heavy soils and rivers, or by the two in combination. Bibliography of 8 titles.

Conservation:

Friedrich, George W. The study of conservation, Minnesota Depts. of Conservation and Education (St. Paul), 56 pp., 2 pls., 1940.

General discussion of conservation accompanied by teaching outline and bibliography in each part of which wildlife has its representation (pp. 23-26, 42-45, 54-55 (22 titles)). Interrelationships are emphasized throughout and the necessity of sound management indicated.

Conservation: Beaver

Highby, Paul R. The story of Minnesota beaver, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 1(2), Nov. 1940, pp. 41-46.

By the year 1900 beavers had been trapped almost to the vanishing point. Re-introduced in Itasca Park in 1901, the initial population of 3 (1 ♂, 2 ♀) had increased by 1907 by some 300 in the Park and had spread to other sections. In 1939 an open season was declared and more than 11,000 pelts were taken. The return to trappers was in excess of $120,000. Conservative management is all that is needed to retain the beaver as a continuing asset. The animals' habits are described, and the problems they cause by flooding areas man desires for other purposes, their relation to trout streams and flood control, and the good they do in creating ponds and meadows also are discussed.

Conservation: Bighorn

Rush, Wm. M. Bighorns need a break, Outdoor Life (353 Fourth Ave., New York, N. Y. 15 cents a copy), 85(1), Jan. 1940, pp. 38-40, 85, 6 photos.

Though protected over most of their range, bighorns continue to decrease; counts of the animals on National Forests showed about 14,000 in 1921 and less than 8,500 in 1938. Hunting, both legal and illegal, was a big factor in eliminating the animals from much of their original range. Golden eagles and bobcats prey upon the lambs, and diseases (pneumonia, scabies) have killed many adults. The sex ratio is unbalanced and selective killing of males is required to restore it. Notes on fighting and jumping. Management suggestions are made. No other wildlife problem in the United States is so urgent as the rehabilitation of the bighorn.

Conservation: Birds in Pan-America

International Committee for Bird Preservation. What is happening to birds in Pan-America, Revista de Agricultura Industria y Comercio de Puerto Rico (Departamento de Agri. y Com. San Juan), 32(3), Sept. 1940, pp. 461-462.

"In the aggregate, millions of individuals of 421 kinds of our United States birds depart in autumn to regions where the word 'conservation' is of little meaning. x x x Furthermore, we can never hope to rebuild to their natural level our supply of migratory wildfowl and shore-birds without the cooperation of the citizens of those Southern Countries where so many of these birds go for six months of every year. Protecting the birds of the Western World is clearly and profoundly an international problem. This movement is supported by friends of the cause who wish to aid in preserving our birds that know no national boundaries."

Conservation: General

Committee. Hearings before the Select Committee on Conservation of Wildlife Resources, House of Representatives, 76th Congress, Third Session, 1940, 429 pp., 1 folded map, tables. (Gov't. Printing Office, Wash., D.C.)

Report of hearings March-May, 1940 at which representatives of 22 State Game Commissions and of 13 Federal Bureaus, besides other organizations and individuals concerned described their achievements and presented their problems. Most of the sections include a record of questions asked by the Committee and of the replies by witnesses. There is so much detail in the report that it can scarcely be outlined here but the book should be consulted by all interested in current phases of wildlife conservation. Some of the included material of more permanent significance is the map of national forests and purchase areas, a descriptive list of Federal Game Refuges on national forests, and a report summarizing "An economic study of wildlife as a supplementary farm enterprise" (pp. 238-251). This is presented without the names of the men who did the work, J. Paul Miller of the Biological Survey and B. B. Powell

of the Bureau of Agricultural Economics, who visited every State in the Union in the course of a two-year investigation, June 1936 to June 1938. This presentation treats the history of the project, contains an outline of the contents of a voluminous manuscript report, and gives a summary of the findings, conclusions, and recommendations. Fuller publication is promised. The present report contains data that has never been available before, a great deal of which is compactly tabulated as to, "Land open to hunting, except as restricted by the property rights of private owners, per hunting license issued by states, 1935" (varies from 33, New Jersey, to nearly 12,000, Nevada); "Agricultural land in relation to potentially huntable land, by states, 1935" (the percentage of potentially huntable land that is devoted to agricultural uses varies from 17.8 in Florida to 99.8 in North Dakota); "estimated acreage providing food and cover for wildlife, by classes of land, 1935" (60.5 percent of the total land area of the United States); and "Estimated acreage on which it is considered economically feasible to improve food and cover for wildlife, by classes of land, 1935" (68.5 percent).

Quotation of a few paragraphs from the general conclusions will suffice to show that the findings of this investigation run greatly counter to some widely-held opinions.

"At the present time, especially on good farm land, there is little or no incentive for the farmer to use his resources in the propagation of game and other wildlife for public or semipublic utilization, because the users of wildlife not only fail to recompense him for his part in providing wildlife and the facilities for its enjoyment, but they also often inflict damage to livestock, fences, and other property. However, in some sections, especially where the land is poorly adapted to the production of agricultural crops, and where trespass is rigidly controlled, considerable opportunity exists for the farmer to increase his income by the production of wildlife for semipublic utilization.

"In general, farmers are penalized for having wildlife, because the more abundant the game or fur animals, the more damage they inflict and the greater the nuisance and damage inflicted by the hunter and trapper. As a result most game and fur animals on farms are there in spite of agricultural practices, or at best accidentally; whereas, if the farmer received proper recognition, he would in many instances produce wildlife as a byproduct incidental to such farm practices as woodlot management, erosion control, and soil and water conservation.

"The findings of the study indicate that if wildlife is to be perpetuated and enjoyed by the public, it must be produced by natural reproduction on private farm land as well as on publicly owned land, and its utilization must be strictly controlled. Pen propagation and stocking have proven expensive and inadequate as a direct means of providing game. Public owned land cannot supply enough wildlife or the facilities for its utilization by the public, and uncontrolled public utilization of wildlife on private farm land has proven destructive to farm property and to wildlife.

"Hunting and aesthetic uses of wildlife are luxuries in the same class as golfing, horseback riding, and going to the movies. It is no more unreason-

able to expect the wildlife user, particularly the hunter who actually consumes wildlife, to pay to the landowner and others the full cost of providing the facilities for his recreation than it is to expect the golfer, horseback rider, and movie goer to pay the full cost of providing the facilities for his respective recreation. Trapping is a business proposition to the trapper, and it is just as reasonable for the farmer or other landowner to receive remuneration for his part in providing fur animals and allowing others to use his land in taking them as it is for the owner of timberland to get remuneration for allowing others to take the timber. These conclusions seem reasonable because there is no denying the fact that the farmer or other landowner is put to expense in providing wildlife and in allowing others to use his land in utilizing wildlife."

Conservation: General

Committee. Conservation of wildlife. Report of the Select Committee on Conservation of Wildlife Resources, House of Representatives, 76th Congress, 3rd Session, House Report 3112 (Government Printing Office, Washington, D. C.), 64 pp., 1941.

The usual annual review of the accomplishments and problems of Federal agencies concerned: Fish and Wildlife Service, National Park Service, Forest Service, Soil Conservation Service, and Civilian Conservation Corps. There is also a symposium on "State versus Federal Control of Nonmigratory Game," contributed to by State and Federal officials, and Recommendations by the Committee.

Conservation: Hawks

Edge, Rosalie, and Ellsworth D. Lumley. Common hawks of North America, Emergency Conservation Committee (734 Lexington Ave., New York, N. Y.), 25 pp., illus., 1940.

The introduction by Ira N. Gabrielson, Director of the national Fish and Wildlife Service, should encourage teachers to regard this leaflet as a reliable guide to instruction about the birds concerned. Statements in it about prey of the various groups of hawks are based chiefly upon publications of the Biological Survey, forerunner of the Wildlife Service. The usefulness of bird-eating hawks is specially discussed, as are also methods used by man in reducing the numbers of the birds, and progress that has been made in protecting them. The leaflet includes questions for younger, and suggestions as to research by more advanced, students, and a bibliography of 29 titles.

Conservation: Pan American

Coolidge, Harold J., Jr. A new Pan American treaty, Science (Lancaster, Pa. 15 cents a copy), 92(2394), Nov. 15, 1940, pp. 458-460.

Discussion of the treaty noted on pp. 54-55 of this issue of WILDLIFE REVIEW.

Conservation: Waterfowl

Dock, Raymond S. No water in the nursery, Saturday Evening Post (Curtis Publishing Co., Philadelphia, Pa. 5 cents a copy), Nov. 16, 1940, pp. 22, 108-111, 2 photos.

Popular article. The drought in the Great Plains wild fowl nursery, although directly injurious, was indirectly beneficial to the birds in convincing the people that effective steps for conservation were necessary. Measures adopted both in the United States and Canada are described.

Conservation: Waterfowl

Lincoln, Frederick C. January duck shooting, Florida Game and Fish (Commission of Game and Fresh Water Fish, Tallahassee), 1(9), Nov. 1940, pp. 4-5, 12, 2 maps.

The maps show the great discrepancy in extent between available breeding and wintering ranges of waterfowl, and the text emphasizes the need for protection on the wintering areas. Any approach toward "spring shooting", with its destructive effect on the breeding stock, should be discouraged.

Conservation: Wisconsin

Leopold, Aldo. Wisconsin wildlife chronology, Wisconsin Conservation Bulletin (Wisconsin Conservation Dept., Madison), 5(11), Nov. 1940, pp. 8-20.

The chronology of outstanding events 1822-1940, and more than 2-pages of bibliography are preceded by ecological discussion. It maintains that variety and quality of wildlife rather than quantity are modified by the impact of civilization, quantity being a manifestation of the productivity of the soil. The typical result is decrease of the more desirable, and increase of the less desirable, types. The extirpated and declining forms of Wisconsin wildlife and the invaders and substitutes are grouped and discussed. Conservation has proceeded through the stages of prohibitions, substitutions, reserving habitat for wildlife, management, and education.

Control: Ant, Fire

Travis, Bernard V. The present status of the methods of control for the fire ant, Cooperative Quail Study Association (Thomasville, Ga.), 9 pp., Nov. 1940.

Solenopsis geminata, in some areas, destroys as much as 15 percent of the quail hatch by eating the chicks in pipped eggs. Experiments in control have been carried on intermittently since 1931; they are described and summarized. In the present state of knowledge, poisoning in spring ant colonies within a radius of 50 feet of quail nests is the most practical thing to do. Poisoned baits and methods of applying them are described.

Control: Cat

Budlong, Robert R. The cat spanker, National Park Service Region III (Santa Fe, N. Mex.) Quarterly, 2(4), Oct. 1940, pp. 35-37, 1 pl.

This will appeal to those who want to discourage cats but not to kill them. The apparatus is pictured and described; having once passed through it, the cats are said never to return.

Control: Crow

Kalmbach, E. R., and S. E. Aldous. Winter banding of Oklahoma crows, Wilson Bul. (Gustav Swanson, University Farm, St. Paul, Minn. 60 cents a copy), 52(3), Sept. 1940, pp. 198-206, 1 fig., 1 table.

At various places and dates, 714 crows were banded; in 3-1/2 years, 143 returns have been received. The places of recovery of the bands are spotted on a map. Of 65 birds reported during the breeding and rearing season, 49 (75 percent) were killed in the prairie provinces of Canada but none in Oklahoma. Crow control, therefore, can have little effect on the breeding populations of game and other birds in that State. "Although winter Crow control in Oklahoma is destined to remove some birds that would enter the problem of Crow-waterfowl relationships in the Canadian provinces, the effect of this control is certain to be much 'diluted' if the results are to be judged in a continental perspective. This comes about because only a portion of the Crows nesting in Canada can be classed as duck-egg predators, and because the Crow, in what might be termed destructive abundance, occupies possibly only a sixth of the duck-nesting area of Canada and Alaska."

Control: Deer damage

Barrett, Paul M. The deer damage committee, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing), 10(1), Nov. 1940, pp. 2, 10, 1 photo.

Deer damage to crops has been increasing during the past ten years. The Conservation Department, looked to for relief, appointed a committee, representing all interests, to consider the situation. After lengthy discussion, the committee was of the opinion that it would be necessary, while other forms of relief are being devised, to continue the issuance of shooting permits, although these are said to be "unsatisfactory to all concerned." The committee made field inspections and experimented with "deer-proof" fences and "buffer" feed strips, without reaching conclusive results. Its findings are presented in 12 paragraphs which state that paying for damage and maintaining artificial feeding are impracticable, suggest purchase of isolated farms where depredations are worst, recommend continued trapping and distribution of deer, urge further experimentation with control measures and improvement of natural food supplies, regulation of the deer herd in critical areas, and search for a type of agriculture that can be carried on satisfactorily in the presence of numerous deer.

Control: Fish-eating birds

Pough, Richard. Blue herons can't read, Bird-Lore (National Audubon Society, 1006 Fifth Ave., New York, N. Y. 30 cents a copy), 42(6), Nov.-Dec. 1940, pp. 507-516, 6 photos.

Investigations at fish hatcheries in 9 States revealed high destruction of fish-eating birds. Although the operations are supposed to be chiefly under permit, hatchery men frequently do not have permits, and of those who do comply with that formality, a considerable proportion do not render reports on the number of birds killed--an observance that is allegedly requisite to continued possession of the privilege. Laxness in enforcement of the regulations is criticized and the Federal government is urged to set an example to hatchery operators by screening its ponds.

Control: General

Fitzpatrick, Frederick L. The control of organisms (Teachers College, Columbia University, New York, N. Y. $2.75 a copy), xi+334 pp., illus., 1940.

Chapter xi (pp. 184-205) is devoted to rodent pests and chapter xv to other divisions of the native fauna. Inter-relations are emphasized and natural, given more attention than artificial, control. Treatment is generalized and condensed as necessary in a textbook. There are numerous footnote references and a terminal bibliography of 3 pages.

Control: Ground squirrel

Becker, E. M. An effective ground squirrel trap, California Dept. Agr. (Sacramento) Bul., 29(3), 1940, p. 152, 1 fig.

Box type killer trap described and illustrated.

Control: Ground squirrel

Becker, E. M. A three-year record of ground squirrel trapping, California Dept. Agr. (Sacramento) Bul., 29(3), 1940, pp. 153-156, 4 tables.

Tabulation of trapped animals with details as to pregnancy and number of embryos of females. The information and conclusions given are from the trapping of some 18,000 ground squirrels. The use of steel traps is less selective than poisoning or gassing, hence employing the box trap referred to in the preceding abstract is recommended. "Trapping is a slow and expensive method of squirrel control and is only justified in eradication work or where all other methods have failed."

Control: Policies

Anon. Information for the guidance of fieldmen and cooperators of the Fish and Wildlife Service engaged in the control of predatory animals and injurious rodents, U. S. Dept. of the Interior Wildlife Circular 5, (Supt. of Documents, Washington, D. C., 5 cents a copy), 8 pp., 1940.

Contents: Necessity for control of wild-animal pests, control functions of the Fish and Wildlife Service, legal authorization for control work, animals on the control program, and instructions regarding field practices.

Control: Rabbit, European

Lockley, R. M. Some experiments in rabbit control, Nature (MacMillan & Co., Ltd., St. Martin's St., London, W. C. 2, England. 1 shilling a copy), 145(3681), May 18, 1940, pp. 767-769.

Account of a 12-year attempt to control, and if possible, exterminate, European rabbits on a rocky island of about 250 acres. Steel traps were given up as inefficient and inhumane. Snares, nets, and wire-mesh traps could not be used in much of the difficult terrain and ferrets proved unsatisfactory. Disease, both of natural occurrence and introduced, passed on, leaving the population as numerous as ever. Fumigation with sulphur was found expensive and difficult to handle and produced a painful death. Cyanogas was more satisfactory and efficient. In three applications the kill is estimated to have reached 96 percent. Forage immediately increased so that 100 sheep brought to the island were unable to keep it down.

Control: Rodents

Cassady, John T., and George E. Glendening. Revegetating semi-desert range lands in the Southwest, Civilian Conservation Corps Forestry Publ. 8 (Supt. of Documents, Washington, D. C. 10 cents a copy), 22 pp., 11 figs., tables, 1940.

Directions for replanting areas deteriorated chiefly through overgrazing. Protection of seedings from livestock and rodents is necessary. The text relating to rodents is here quoted: "Rodents are often a definite limiting factor to successful artificial revegetation, particularly on sandy mesquite lands or other brushy lands that provide excellent escape cover and homesites for the rodents. Intensive control campaigns will be necessary on such areas prior to the revegetation work, followed by additional control if the rodent population becomes large before the plant cover is well established. On areas densely populated with rodents, shrubs that quickly outgrow the reach of rodents may be preferable to grass."

Control: Rodents

Piper, S. E., and Etholbert Johnson. Some studies of Peromyscus and other rodents in the San Bernardino Mountains of California 1937 to 1940, California Dept. Agr. (Sacramento) Bul., 29(3), 1940, pp. 131-145, 1 fig.

Four species of Peromyscus, 5 of squirrels, and one wood rat are being combated as carriers of sylvatic plague. The Peromyscus proved especially difficult to poison. Tests of their preferences among bait materials and poisoned baits both in the field and laboratory are reported upon. Alternation of baits is necessary to success. Three newly devised toxic baits that were effective are described.

Control: Water weeds

Brown, C. J. D. Water weeds--their value and control, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing), 9(10), Aug. 1940, pp. 6-7, 11, 4 photos.

Plants that require control under certain conditions and suggestions as to means including chemicals and mechanical devices.

Cycles

Braestrup, F. W. The periodic die-off in certain herbivorous mammals and birds, Science (Lancaster, Pa. 15 cents a copy), 92(2390), Oct. 18, 1940, pp. 354-355.

The cause of shock-disease, agent in the die-off of snowshoe hares, is unknown but it may be dietary deficiency. That might depend upon the mineral content of plants, and that in turn upon climatic factors. This reasoning admits of the explanation of cycles in organisms by the indirect influence of meteorological phenomena. References to 17 cognate publications.

Cycles: Fox, Red

Cross, E. C. Periodic fluctuations in numbers of the red fox in Ontario, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(3), Aug. 1940, pp. 294-306, 5 figs., tables.

Digest of fur returns of the Hudson's Bay Company for Ontario, 1916-1937 with special consideration of the records of individual trading-posts. Figures representing all parts of Canada seem to support the theory of cycles, but upon local analysis, assume a different aspect. "The concept of a Canadian fur cycle in the generally accepted sense of a sort of continent-wide biological tide is an intriguing speculation but on the basis of the evidence brought forward to date it must be regarded as 'not proven'." Bibliography of 7 titles.

Cycles: Grouse, Ruffed

Tubbs, F. F. Grouse cycles, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing), 9(12), Oct. 1940, pp. 2, 10.

Review of game reports since 1896 showing that fluctuations in the numbers of grouse occurred but until recently they were not understood. The author believes there is no need to change the hunting regulations in response to phases of the cycle--the scarcity of the birds evidently protecting them during "lows."

Cycles: Hare, Snowshoe

Chitty, Dennis, and Charles Elton. The snowshoe rabbit enquiry 1938-39, Canadian Field-Naturalist (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada. 25 cents a copy), 54(8), Nov. 1940, pp. 117-124, 2 figs., 2 tables.

Continuation of a series previously noted in WILDLIFE REVIEW. The summary indicates that the years 1937-38, 1938-39 "have been, generally speaking, a period of recovery from the bottom of the latest ten year cycle, but there were well marked regional differences in phase." The details are discussed, mapped, and tabulated for both Canada and the United States.

Cycles: Hare, Snowshoe

Green, Robert G. Once more the grouse are back, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul, Minn.), 1(3), Dec. 1940, pp. 11-14, 1 fig.

Sketch of the snowshoe hare cycle and graph showing the population range revealed by 8 years of study--from 478 to 32 hares per square mile. The grouse cycle, not so well known, is nevertheless real and should be taken into account in defining open and close seasons. A number of questions are presented, satisfactory answers to which are needed as a guide to management.

Cycles: Hare, Snowshoe

Green, R. G., and C. A. Evans. Studies on a population cycle of snowshoe hares on the Lake Alexander Area. III. Effect of reproduction and mortalities of young hares on the cycle, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 347-358, 3 figs., 5 tables.

Authors' abstract: "On the basis of findings in 230 female hares, of which 140 were pregnant, collected during the reproductive seasons of seven years (1932-1938), it is concluded that a relatively constant reproductive rate was maintained throughout the years when the snowshoe hare population was undergoing changes from maximum abundance to greatest scarcity in Minnesota. No significant differences were noted in the various years in the duration of the reproductive season, the proportion of female hares pregnant at various times during that season, and the average number of embryos to the pregnant hare. By combining the data on reproduction with that pertaining to annual censuses and the determination of age ratios (Papers I and II), we obtain an estimate of the number of hares born each year and of the mortality rate among these hares during the first nine months of life. The mortality among young hares showed pronounced variations synchronous with the several stages of the cycle. In the years 1933 through 1937, the rate of survival of young hares varied between 8 and 29 per cent, and the population decreased markedly. Of the hares born in 1932 and in 1938, a much greater proportion survived, and, as a result, the population increased in those years. It is concluded that variation in the mortality among young animals was the principal factor in the fluctuation of

the population of hares on the Lake Alexander Area during the recent cycle." Bibliography of 5 titles.

Destruction: Bison

[Halliday, W. E. D.] The reduction of the buffalo herds, Forest and Outdoors (610 Canada Cement Bldg., Montreal, Canada), 36(8), Aug. 1940, pp. 257-258, 1 photo.

Destruction of the Wainwright herd was decided upon as a sanitary measure. A high proportion of the animals were affected by tuberculosis and many were infested by liver flukes, a problem complicated by the presence of elk. The range is to be kept fenced and free from grazing animals. Finally if restocking is considered desirable, healthy animals can be released in a disease-free habitat. Notes on the stock of bisons at other points are given to show that the animals are in no danger of extermination.

Destruction: Fox, Kit

Bunker, C. D. The kit fox, Science (Lancaster, Pa. 15 cents a copy), 92(2376), July 12, 1940, pp. 35-36.

George A. Allman, an early settler in the West, a government guide, and fossil collector, told the writer "that it was the general custom of the early cattlemen to place poison at all the undevoured buffalo carcasses to destroy wolves. It was his observation that the little swift foxes were always the first to take the poison. He stated that the gray wolf had not been seen in Kansas since 1879."

Diseases and Parasites

Dikmans, G. Helminth parasites of North American semidomesticated and wild ruminants, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(2), July 1939, pp. 97-101, 1 table.

Tabulation of some 40 kinds of nematodes, trematodes, and cestodes known from 12 species of big game ruminants. Review of the literature and citation of 16 titles.

Diseases and Parasites

Dinaburg, A. G. Helminth parasites collected from deer, Odocoileus virginianus, in Florida, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(2), July 1939, pp. 102-104, 2 tables.

Of 308 deer examined, 198 or 64% were infested; the incidence of 2 groups of trematodes and 8 of nematodes is tabulated. Individual records from several other localities also are mentioned.

Diseases and Parasites: Acanthocephala

Van Cleave, Harley J., and Wm. C. Starrett. - The Acanthocephala of wild ducks in central Illinois, with descriptions of two new species, Trans. Amer. Micr. Soc. (James E. Ackert, Kansas State College, Manhattan. 75 cents a copy), 59(3), July 1940, pp. 348-353, 1 pl.

Twenty-one out of 56 ducks representing 8 species were infected. Five species of Acanthocephala were found, of which 2 are described as new: Polymorphus cucullatus from the hooded merganser and P. acutis from the mallard. These species are illustrated and all are annotated. Bibliography of 6 titles.

Diseases and Parasites: Acarina

Mathoson, Robert. Ticks and disease with special reference to spotted fever and tularaemia in the eastern States, Cornell Veterinarian (Ithaca, N. Y.), 30(2), April 1940, pp. 167-177, 6 figs., 1 table.

General discussion of ticks, their life histories, and relations to diseases; birds and mammals mentioned.

Diseases and Parasites: Aspergillosis

Davis, W. A., and L. S. McClung. Aspergillosis in wild herring gulls, Journ. Bacteriology (Williams & Wilkins Co., Baltimore, Md.), 40(2), Aug. 1940, pp. 321-323, 1 fig.

Epizootic in Massachusetts, symptoms, lesions.

Diseases and Parasites: Cestoda, Cladotaenia

McIntosh, Allen. A new taenioid cestode, Cladotaenia foxi from a falcon, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 7(2), July 1940, pp. 71-74, 1 fig.

From the duck hawk; description, illustration, comparative notes; previous records of the genus from North America; discussion of the characters of the genus and list of included species.

Diseases and Parasites: Cestoda, Dendrouterina

Olsen, O. Wilford. The cysticercoid of the tapeworm Dendrouterina nycticoracis Olsen, 1937 (Dilepididae), Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(1), Jan. 1939, pp. 20-21, 1 fig.

From catfishes (Ameiurus melas), Minnesota; the third host probably is a water flea; description, illustration.

Diseases and Parasites: Chastek paralysis

Green, R. G., and C. A. Evans. A deficiency disease of foxes, Science (Lancaster, Pa. 15 cents a copy), 92(2381), Aug. 16, 1940, pp. 154-155.

The Chastek paralysis dealt with in papers abstracted in previous issues of WILDLIFE REVIEW (Nos. 4, June 1936, p. 4; 6, Nov. 1936, p. 10; 10, Oct. 1937, p. 8; 15, July 1936, p. 8; 16, Nov. 1938, p. 8; and 19, April 1939, p. 16). Account of occurrence, cause, symptoms, and pathology. Authors' summary: "A common and highly destructive dietary disease of silver foxes in captivity is pathologically the counterpart of Wernicke's hemorrhagic polioencephalitis of man. The disease in foxes is caused by feeding fish as 10 per cent., or more, of the diet. It is probable that the fish induce a B_1 avitaminosis which causes the characteristic pathology and the resultant symptoms."

Diseases and Parasites: Diptera, Protocalliphora

Guberlet, John E., and H. H. Hotson. A fly maggot attacking young birds with observations on its life history, Murrelet (Mrs. Martha Flahaut, State Museum, Seattle, Wash. 50 cents a copy), 21(3), Sept.-Dec. 1940, pp. 65-68, 4 figs.

Review of knowledge of Protocalliphora and citation of 12 references to literature. Notes on appearance and structure of the larva (illus.) and on life history. The paper is based on observations upon a single English sparrow nestling which died as a result of subcutaneous infestation by 21 maggots.

Diseases and Parasites: Lead poisoning

Toner, G. C. Duck mortality in the Cataraqui Marshes, Canadian Field-Naturalist (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada. 25 cents a copy), 54(7), Oct. 1940, pp. 104-105.

Near Kingston, Ontario; four dead and three sick birds (among 6 and 4, respectively) appeared to have lead poisoning. Bibliography of 7 titles.

Diseases and Parasites: Nematoda

Dikmans, G. Two new nematodes from rodents, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(1), Jan. 1939, pp. 1-4, 2 figs.

Citellincides zapodis n. gen. et. sp. from jumping mice (Napeozapus), N. C., and Muricolus harpespiculis n. gen. et. sp. from a pika (Ochotona), Wyo.; described and illustrated.

Diseases and Parasites: Nematoda

Dikmans, G. A note on the genera Nematospiroides Baylis, 1926, and Sincosta Roe, 1929 (Nematoda, Heligmosomidae), with descriptions of two new species of Nematospiroides, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 7(2), July 1940, pp. 79-82, 1 fig.

Comparison of the genera named; descriptions and illustrations of N. longispiculatatus from meadow mouse and muskrat (D. C. and N. J.) and N. carolinensis from red-backed mouse (N. C.). Key to 3 species of Nematospiroides.

Diseases and Parasites: Nematoda, Aproctella

Crom, Eloise B. Redescription and emendation of the genus Aproctella (Filariidae), nematodes from gallinaceous birds, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(2), July 1939, pp. 24-25.

A. stoddardi from bob-white and ruffed grouse.

Diseases and Parasites: Nematoda, Diplotriaena

Morgan, B. B., and E. F. Waller. The occurrence of a rare filariid nematode from a crow, American Midland Naturalist (University of Notre Dame, Notre Dame, Ind. $1.00 a copy), 24(2), Sept. 1940, pp. 379-381.

D. tricuspis in Iowa; description; notes on other microfilaria in birds; bibliography of 12 titles.

Diseases and Parasites: Nematoda, Quadriplotriaena

Wehr, E. E. New genera and species of Filarioidea II. Quadriplotriaena dolichodemus n. gen., n. sp., Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(1), Jan. 1939, pp. 32-33, 1 fig.

From the magpie, Montana; description, illustration; key to 3 genera of Diplotriaeninae.

Diseases and Parasites: Nematoda, Sarconema

Wehr, Everett E. New genera and species of Filarioidea. III. Sarconema eurycerca n. gen., n. sp., Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(2), July 1939, pp. 95-97, 1 fig.

From the whistling swan, Misc. and Utah; description, illustration.

Diseases and Parasites: Parasites of Illinois game

Leigh, W. Henry. Preliminary studies on parasites of upland game birds and fur-bearing mammals in Illinois, Illinois Natural History Survey (Urbana), Bul. 21(5), Aug. 1940, pp. 185-194, 1 pl., 2 figs., 2 tables.

Discussion of parasites both internal and external (so far as found) of the prairie chicken, bob-white, and ring-necked pheasant; and of the helminths of the opossum, red fox, raccoon, skunk, and muskrat. Bibliography of 19 titles.

Diseases and Parasites: Plague

Byington, L. B. Two epizootics of plague infection in wild rodents in the western United States in 1938, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 55(33), Aug. 16, 1940, pp. 1496-1501, 3 figs., 3 tables.

Lincoln County, Wyoming, involving Uinta and Wyoming ground squirrels, woodchuck, and prairie-dog; and Catron County, New Mexico, affecting Say's rock squirrel, white-footed mouse, and zuni prairie-dog. Author's conclusion: "Epizootic outbreaks of plague in rodents are occurring in the western United States. These are part of a widespread enzootic of the disease in many species of rodents. The two outbreaks here reported took place in regions sparsely inhabited by man and no human cases were known to have been associated with the infection in rodents."

Diseases and Parasites: Porocephaliasis

Penn, George H., Jr., and Ernest C. Martin. The occurrence of porocephaliasis in the Louisiana muskrat, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 13-14.

Authors' abstract: "1,032 carcasses of muskrats (Ondatra zibethica rivalicia) from southeastern and southwestern Louisiana were examined. Nymphs of Porocephalus crotali are recorded for the first time from (the liver and lungs of) muskrats. Ninety-six (or 9.30%) had porocephaliasis, varying from a proportion of 14.5% and 13.0% at Willow Bayou Camp (Cameron Parish) and Michaud (Orleans Parish), to 1.2% and 2.5% at Road and Main Camps (Cameron Parish), respectively. One female was infested with over 1,600 nymphs. Histological examination showed nymphs isolated from the host tissue by a capsule of homogenous material. The investigation is being continued."

Diseases and Parasites: Protozoa, Sarcocystis

Erickson, Arnold B. Sarcocystis in birds, The Auk (Rudyerd Boulton, Field Museum, Chicago, Ill. $1.00 a copy), 57(4), Oct. 1940, pp. 514-519, 1 pl.

Description of infestations in some Minnesota game birds, list of host birds of the world (20 species), and bibliography of 28 titles.

Diseases and Parasites: Prunus in relation to diseases of cultivated plants

Groh, Herbert, and Harold A. Senn. Prunus in eastern Canada, Canadian Journ. Research (National Research Council, Ottawa), 18(7), July 1940, pp. 318-346, 10 figs.

Key to 14 native or naturalized species with notes on their distribution. The paper was written to aid those who must consider the role of Prunus in the maintenance of certain economically important plant diseases. Instances cited are the serving as hosts for leafhoppers and aphids that transmit peach and potato diseases. Cultivated and naturalized species are considered of little significance but the choke cherry probably is, and the bird cherry may be, of importance.

Objections to Prunus, a genus of considerable value to wildlife, thus increase and the problem of what to do about these plants is further complicated for the wildlife manager. Not only Prunus but other genera desirable from the wildlife standpoint are involved. Whether economically harmless but still biologically valuable species, or whether unrelated and harmless substitutes, can be found, the problem is one that should receive the serious consideration of both researchers and technicians in the wildlife field.

Diseases and Parasites: Rabbit parasites

Smith, Charles C. Notes on the food and parasites of the rabbits of a lowland area in Oklahoma, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 429-431, 2 tables.

Author's abstract: "The summer ranges of two species of rabbits (Sylvilagus floridanus alacer and S. a. aquaticus) in Cleveland County, Oklahoma, are distinct but in the winter the lowland areas to which the swamp rabbits are restricted are invaded by cottontails. Winter food habits and parasites of the two species of rabbits were compared during December and January, 1939-40. Both species fed largely on bark and twigs during the winter but ate also the tap-roots of sweet clover (Melilotus alba). Both showed a high percentage of infestation with the rabbit tapeworm (Cittotaenia ctenoides) while only the cottontails harbored larval dog tapeworms (Cysticercus pisiformis). The red stomach worm (Obeliscoides cuniculi) was limited to the swamp rabbits while Trichostrongylus calcaratus was present in a high percentage of both species. Two larvae of Multiceps serialis, the many-headed bladderworm stage of a dog tapeworm, were found in the cottontails. Data were obtained from 11 swamp rabbits and 32 cottontails."

Diseases and Parasites: Relapsing fever

Davis, Gordon E. Ticks and relapsing fever in the United States, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 55(51), Dec. 20, 1940, pp. 2347-2350, 2 tables.

The ticks concerned, all members of the genus Ornithodoros, are parasites of rodents and rabbits; records of infestation are given. Author's summary: "Six species of Ornithodoros have been recognized in the United States. One or more species have been reported from each of 17 States. Tick-borne relapsing fever is present in 11 States. The known vectors are turicata in Texas and Kansas, and hermsi in California, Colorado, and northern Idaho. O. parkeri is the only known species in a large area from which 17 cases have been reported. Spirochetes have been recovered from talaje collected in Arizona and from parkeri collected in Wyoming, Montana, and Utah." Bibliography of 23 titles.

Diseases and Parasites: Trematoda, Eurytrema

McIntosh, Allen. A new dicrocoeliid trematode, Eurytrema komareki n. sp., from a white footed mouse, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(1), Jan. 1939, pp. 18-19, 1 fig.

Locality, Georgia; description, illustration, comparative notes.

Diseases and Parasites: Trematoda, Leptophyllum

McIntosh, Allen. Description of a plagiorchid trematode, Leptophyllum tamiamiensis, n. sp., from a poisonous snake, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(2), July 1939, pp. 92-94, 1 fig.

From the cotton-mouth, Florida; description, illustration, comparative notes.

Diseases and Parasites: Trematoda, Opisthorchoidea

Price, Emmett W. A review of the trematode superfamily Opisthorchioidea, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 7(1), Jan. 1940, pp. 1-13, 1 table.

History of knowledge of the group, tabulation of characters of the cercariae, and discussion of those of adults. Revised diagnoses of the families and subfamilies, and lists of their included genera. Bibliography of 49 titles.

Diseases and Parasites: Trematoda, Plagiorchis

Olsen, O. Wilford. The occurrence of the fluke Plagiorchis potanini Skrjabin, 1928 in Franklin's gull (Larus pipixcan Wagl.) in North America, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(1), Jan. 1939, p. 20.

South Dakota; description.

Diseases and Parasites: Trematoda, Polystomatidae

Price, Emmett W. North American monogenetic trematodes. IV. The family Polystomatidae (Polystomatoidea), Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(2), July 1939, pp. 80-92, 1 fig.

Diagnosis of the superfamily and key to its families; diagnosis of the family and key to its subfamilies and genera. These are 7, of which 2 are described as new: Polystomoidella, genotype Polystoma oblongum Wright, and Neopolystoma for P. orbiculare Stunkard. Polystomoidella whartoni n. sp. also is described from North American turtles. Notes on all of the genera and species; illustrations; bibliography of 29 titles.

Diseases and Parasites: Trematoda, Pseudapatemon

McIntosh, Allen. Pseudapatemon aldousi, new species (Trematoda: Strigeidae) from the American woodcock, Philohela minor, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 7(1), Jan. 1940, pp. 14-16, 1 fig.

From New Brunswick and Maine; description, illustration, comparative notes.

Diseases and Parasites: Trematoda, Rhytidodoides

Price, Emmett W. A new genus and two new species of digenetic trematodes from a marine turtle, Proc. Helminthological Soc. Wash. (Edna M. Buhrer, U. S. Bureau of Plant Industry, Washington, D. C.), 6(1), Jan. 1939, pp. 24-25, 1 fig.

Rhytidodoides intestinalis and R. similis from Chelone mydas (zoological park specimen).

Diseases and Parasites: Ulcerative enteritis

Bass, Charles C. Observations on the specific cause and the nature of "quail disease" or ulcerative enteritis in quail, Proc. Soc. for Experimental Biol. and Medicine (A. J. Goldfarb, College of the City of New York), 42(2), Nov. 1939, pp. 377-380. Address of author, School of Medicine, Tulane University, New Orleans, La.

The author believes that the gram-positive Corynebacterium, reported by Morley and Wetmore (see WILDLIFE REVIEW No. 7, Dec. 1936, p. 8) as causative, is a secondary invader. He attributes the disease to a gram-negative bacillus (unnamed) and describes the methods he found successful in isolating it and in transmitting the infection to previously unaffected birds. He says, "Although I have not been able to find the specific organism in an egg before hatching, the observations x x x indicate that very young birds acquire quail disease through eggs infected with the specific organism and layed by carriers of the infection."

Ecology: Availability of bob-white foods

Chenault, Tandy P. The phenology of some bob-white food and cover plants in Brazos County, Texas, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 359-368, 1 chart.

Author's abstract: "This investigation determined the periods of the year in which some of the most important food plants produced the seeds on which bob-whites largely feed, and also the times when these and other plants were available as shelter in the post-oak type of central eastern Texas. As nearly as practicable, the first date of each phase of plant development was recorded; in some instances, however, the beginning of a particular phase was overlooked. It was easy, however, to determine the period during which a species or a group of species was at the peak of a given activity-phase. From the standpoint of food availability to quail, dissemination of the seeds proved to be the most important phase. Flowering was important as an indicator of the time when a certain species came into prominence. The plants fell naturally into four groups, namely, those flowering in winter, spring, summer, and autumn. There was only one wave of winter-flowering plants. Plants that bloomed in Spring usually sprouted during January and February. This group was the most numerous in species of all. Summer plants began flowering in June. Strangely enough, while this group had fewer representatives, it was possibly more important in producing quail food than any of the others. There was only one wave of autumn-flowering plants." Bibliography of 7 titles.

Ecology: Beaver vs. trout

Cook, David B. Beaver-trout relations, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(4), Nov. 1940, pp. 397-401.

Sketch of beaver habits, and colony formation and duration. The activities of the animals that affect trout include: cutting or drowning of streamside trees exposing the water to the sun, impounding water by dams, which usually tends to warm it, and through accumulation of vegetable debris, to use up oxygen and reduce the animal populations important as sources of trout food; the dams, moreover, obstruct movements of fishes and encourage over-fishing. They are also in various ways unfavorable to trout spawning. "Where the ponds are small, the stream flow irregular and subject to drought, or the temperatures low, beaver ponds will be of decided benefit to trout. Other values also are involved, as water storage, and usefulness to ducks, fur animals, and deer. Each stream should be studied individually and beaver relations appraised on their merits. Bibliography of 5 titles.

Ecology: Census methods

Cahalane, Victor H. A trap-removal census study of small mammals, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 42-67, 2 pls., 11 figs.

Author's abstract: "Study plots were established in 'typical' areas of the ecologic communities of the Chiricahua Mountains, southeastern Arizona. Tracks, dens, feeding spots, and other evidences of the presence of small mammals were identified and counted. The animals were then trapped as rapidly as possible, using a large number of traps within the plots and on 'guard strips' surrounding the boundaries. A fairly constant index between signs of activity and actual population was thus established. By the use of such check plots, it is possible to make a final estimate of the total population of any larger area in the territory embraced in the study. The ratio of catch to signs, obtained from the trap records and sign counts made on the three census plots, is as follows: (1) Yellow pine community--Eutamias d. dorsalis, one to 9.6; Peromyscus maniculatus rufinus and P. boylii rowleyi, one to 11.3; (2) oak community--Citellus g. grammurus, one to 8.7; Eutamias d. dorsalis, one to 10.5; Peromyscus boylii rowleyi, one to 0.4; Neotoma a. albigula, one to 2.7; (3) mesquite-grass community--Thomomys bottae extensatus, one to 1; Dipodomys s. spectabilis, one to 0.4; Neotoma a. albigula, one to 0.29; other small rodents (Citellus, Perognathus, Dipodomys merriami, Onychomys, and Peromyscus), one to 2.15." Bibliography of 10 titles.

Ecology: Census methods, deer

Bennett, Logan J., P. F. English, and Randal McCain. A study of deer populations by use of pellet-group counts, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 398-403, 7 tables.

Authors' abstract: "Year-round pellet-group counts of white-tailed deer (Odocoileus v. virginianus and O. v. borealis) in several forest types in Pennsylvania indicated that such counts can be used for determining approximate deer populations, deer movements, and the utilization of forest types by deer. The counts were made monthly during the spring and summer on 1/10-acre quadrats and on strips 11 feet wide and varying from 700 to 2,640 feet in length."

Ecology: Cover mapping

Dalke, Paul D. Development of a statewide system of cover-mapping applicable to Missouri wildlife range, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 103-107, 2 pls.

Author's abstract: "The succession of plant associations developing from uplands, flood plains, ponds, lakes, and swamps is indicated by the primary divisions of the cover types. Symbols are used to represent the various stages in succession within each series. The symbols for woodland cover types embrace dominant species, density, and age class. If an understory of shrubs is present it is indicated as the denominator of the overstory symbol. Density of vegetation is expressed by one, two, or three lines representing light, medium, or heavy growths. On agricultural lands it may be desirable to indicate permanent cover types in areas as small as two acres. In Missouri for general wildlife management purposes, twenty-four upland types are recognized, seven in the flood plain succession and seven in the pond, lake, and swamp series. Base

maps are prepared from aerial photographs on a scale of 4" = 1 mile." Bibliography of 8 titles.

Ecology: Effects of flooding

Trimble, Ruth. Changes in bird life at Pymatuning Lake, Pennsylvania, Annals Carnegie Museum (Pittsburgh, Pa.), 28, pp. 83-132, Pls. 8-11, Oct. 1940.

Of interest to wildlife managers as reporting changes in bird life following flooding. The original character of the Pymatuning bog is described and the history of the tract sketched. It is now a wildlife refuge under jurisdiction of the Pennsylvania Game Commission. An annotated list of species is presented and comparisons drawn with those recorded for 1928 which show that 22 migrants, 5 accidental visitants, and 15 breeding species have been added to the avifauna mostly in response to changes in ecology due to flooding.

Ecology: Effects of hurricane

Woods, Gordon T. New England hurricane benefits wildlife, American Forests (American Forestry Assoc., 919 Seventeenth St., N. W., Washington, D. C. 35 cents a copy), 46(9), Sept. 1940, pp. 402-404, 424.

Author's abstract: "Although thirteen hurricanes have crossed New England within the last century, none of these inflicted such destruction and disaster nor improved forest wildlife conditions as did the hurricane of September 21, 1938. Because a large part of New England's wildlife is dependent on wooded areas for all or part of its habitat, the question has arisen as to the effect of the 1938 hurricane on wildlife. It is believed that the storm did more for the wild animals than man could have done in fifty years.

"Openings made in forest canopies allowed for increased plant growth and a greater variety of food plants. Considerable browse was made available to deer and rabbits by fallen trees. Trees which have fallen into streams or along lake shores furnish support for large numbers of insects and other aquatic organisms. Upturned root systems not only provide excellent dusting places where animals may rid themselves of external parasites, but grit and minerals will be available after deep snowfalls. The storage of logs in ponds has restricted boat fishing, and the resulting shade has been beneficial to trout ponds. Furthermore, bark dropping to the bottom has increased the fertility of these ponds. Conditions for fur-bearers have also been improved.

"We do not need windstorms to create productive habitats. Intelligent environmental improvement by man is obviously less expensive and far more beneficial than are conditions created by high winds."

Ecology: Effects of logging

Hormay, A. L. The effect of logging on forage, Chronica Botanica (Box 151, Waltham, Mass. 40 cents a copy), 6(1), Oct. 7, 1940, pp. 6-7, 2 tables.

"From general field observations it appears that grazing capacity is reduced for a year or two following logging and then rapidly builds up and surpasses the capacity of the virgin timber forage. As tree reproduction reoccupies the ground the grazing capacity reaches a maximum and then slowly takes a downward trend." This paper deals with only the first phase of the cycle. It lists the principal forage plants, gives the percentage of utilization of each, and shows that about a 20 percent reduction in forage immediately follows logging.

Ecology: Grassland

Carpenter, J. Richard. The grassland biome, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 10(4), Oct. 1940, pp. 617-684, 7 figs., 7 tables.

Associations and relationships of the principal plants and animals, including the vertebrates. Extensive bibliography.

Ecology: In land use

Graham, Edward H. Ecology and land use, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), Nov. 1940, pp. 123-128, 6 photos, 2 diagrams.

An essay on the desirability of applying ecological thinking in land use. Familiar ecological problems cited are those of the relations of: Mice, cover, and trees in orchards; snowshoe hares and small mammals to forest reproduction; and rabbits and rodents, coyotes, and livestock on the range. "To think ecologically requires only a knowledge of facts and an ability to relate them correctly." In some instances, technical assistance may be needed in the proper interpretation of the facts. Indicative phases of hemlock-hardwood forest, and of wheatgrass grazing land are described in illustration of methods of ecological appraisal. Good management often consists of arrest of succession and maintenance of the stage desired by man. This is illustrated by the use of controlled burning to favor growth of leguminous food plants in longleaf pine lands. Although dealing with elements largely exotic (unfortunate introduction of which is discussed), the operations of the Soil Conservation Service so far as possible are based on ecological concepts.

Ecology: Mosquito control operations

Stearns, L. A., Donald MacCreary, and F. G. Daigh. Effects of ditching for mosquito control on the muskrat population of a Delaware tidal marsh, Del. Agr. Expt. Sta. Bul. (Newark) 225, 55 pp., 24 figs., 8 tables, April 1940 (received August).

The total annual catch of muskrats is about 150,000. Sale of pelts provides an important part of the cash income of many farmers; worth while returns also are obtained from the meat. "Good muskrat marshes are generally considered to be fully as valuable as any farm land." From an observational and experimental study, the results of which are given in detail, it is con-

cluded that effective ditching rapidly lowers the water table and in a short time brings about changes in the vegetation, replacing plants that are useful by others that are practically worthless. Good muskrat marshes are relatively unimportant in mosquito production. Needs of the human population may call for their drainage but this should be done only where necessary. Control operations in some sections are unwarranted. Bibliography of 23 titles.

Ecology: Pheasant, Ring-necked

Leedy, Daniel L. Natural pheasant production in relation to agricultural land use, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 137, 9 pp. (mimeographed), 1940.

Condensation of a Doctor's thesis (of 229 pages, with a bibliography of 89 titles, and with 28 illustrations). Objectives of the study are stated, and the distribution of the pheasant and factors in its ecology are discussed. Food habits and economic status are summarized. Other topics treated are: Farm practices affecting the availability of pheasant food and cover, land use in relation to pheasant mortality and nest destruction, and the importance of crop and other lands in the life equation of the pheasant. A list of 8 indicators of superior pheasant range concludes the abstract.

Ecology: Populations, Bird

Hickey, Joseph J. Bird-Lore's fourth breeding-bird census, Bird-Lore (1006 Fifth Ave., New York, N. Y. 20 cents a copy), 42(5), Sept.-Oct. 1940, Supplement, pp. 474-492.

Reports from 14 States, with descriptions of habitats and lists of species with their numbers, often showing comparative figures for a series of years. Primarily studies of population densities, the results in most instances being expressed in pairs per 100 acres.

Ecology: Populations, Fox

Wade, Douglas E. Some more foxy business, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(6), Sept. 1940, pp. 6-7, 29, 4 figs., 2 tables.

Populations of red and gray foxes and their trends in Pennsylvania, 1933-40. Both have recently been increasing from a low in 1935-36; a cycle is indicated. Data bearing on the density of fox populations are summarized in maps and tables. The take of gray foxes for bounties was at the rate of one animal to from 1.4 to 3.8 square miles in various counties.

Ecology: Populations, mouse, Deer

Blair, W. Frank. A study of prairie deer-mouse populations in southern Michigan, American Midland Naturalist (University of Notre Dame, Notre Dame, Ind. $1.00 a copy), 24(2), Sept. 1940, pp. 273-305, 4 figs., 6 tables.

Peromyscus maniculatus bairdii. The live-trapping method and the marking technique are described and the ecological associations, populations, and ranges discussed. Abundance varies (maximum 9.2 per acre) and there is a marked seasonal cycle in numbers. Home ranges overlapped and averaged .51 acre for females and .63 acre for males. Sex ratio, even; average number of young per litter, 4; number of broods per year, 4. Bibliography of 16 titles.

Ecology: Populations, numbers and weights

Mohr, Carl O. Comparative populations of game, fur, and other mammals. American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 24(3), Nov. 1940, pp. 581-584, 1 fig.

Citation of 18 cognate references, the results in which have been analyzed and graphed to show the numbers of individuals per acre and the total weights of the populations per square mile. The results have so much consistency that the author suggests comparison with them as a test of the accuracy of new censuses. The total weight of each herbivorous species seldom exceeds 640 pounds, and of each predatory species, 75 pounds, to the square mile.

Ecology: Populations, Shrew, Short-tailed

Blair, W. Frank. Notes on home ranges and populations of the short-tailed shrew, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 21(2), April 1940, pp. 285-288.

Study in Livingston County, Michigan, 1938-39. Largest home range of a male 4.43 acres, of a female 0.88 acre. Sex ratio about even. Populations from 0.8 to 2.2 individuals per acre. Bibliography of 11 titles.

Economics: Damage by crows

Craig, J. W. Crow damage to conifers, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 38(12), Dec. 1940, p. 969.

Breaking off shoots and branches of planted Scotch, red, and white pines, New York. Most damage along highways where animals killed by automobiles attracted the crows. "Although the effects of the injuries persist for several years, no evidence has been found to indicate serious consequences. The principal result is a poor form of the roadside trees."

Economics: Whales

Brandt, Karl. Whale oil. An economic analysis (Food Research Institute, Stanford University, California), xii+264 pp., 30 charts, 30 tables, 1940.

An exhaustive work but not a conservation document; throughout whales are treated strictly as a "source of wealth." Some chapter headings indicating the nature of the contents are: Whales as a source of raw materials; The rise, decay, and revival of whaling; Modern whaling; International competition in

whaling; International cooperation in whaling; and The outlook for whale oil and whaling.

Education: Conservation

Ward, Henry B., et al. Education in conservation, National Wildlife Federation (1212 Sixteenth St., N. W., Washington, D. C. 10 cents a copy), 39 pp., 1940.

Minutes of a committee meeting and other discussion on conservation education in the public schools. Henry B. Ward urges enlisting the aid of those who are training the teachers of today and tomorrow, the preparation of teaching material that will be locally suitable, the development of constant promoters of the movement, and the study of nature more than books. R. Worth Peters points out the interdependence of education and legislation, they must be developed together; conservation education should be given a definite place in State curricula; he also advises working with the living world. D. L. Kinnear cites the need of reworking technical material so that it can be used in teaching children, and the value of films, lantern slides, and other illustrative material, made at least in part by the students themselves; teaching material should have direct local application, and helps should be provided for leaders on field trips. Frank Thone advises all possible use of the results of research--the propagation of existing knowledge. Jatson Davis urges the educational value of the newspaper; emotional reporting arouses interest, thus preparing the way for education. Howard Zahniser stresses simplification of the conservation message and persistence in repeating it in an interesting way.

The publication includes also a partially annotated program of the Fifth North American Wildlife Conference held in Washington, D. C., March 18-20, 1940.

Food Habits: Animals injurious to forest reproduction

Moore, A. W. Wild animal damage to seed and seedlings on cut-over Douglas fir lands of Oregon and Washington, U. S. Dept. of Agriculture Tech. Bul. 706 (Supt. of Documents, Washington, D. C. 5 cents a copy), 28 pp., 14 figs., 9 tables.

The habits and abundance of the principal seed-eaters and the influence of slash burning upon their populations are treated in some detail. Injury to trees and indices of damage also are discussed. Part of author's summary: "Seed-eating mammals, active at all times of the year, find in forest-tree seeds a favorite food. White-footed mice are the most important consumers, as they occur over the entire region. The shrew and related forms, although classed as insect eaters, also take heavy toll of seeds, owing to their great abundance in the coastal strip. Squirrels, chipmunks, and other mammals are of minor importance in total seed consumption. Reproduction from such seeds as escape and germinate furnishes food for browsing animals. The brush and snowshoe rabbits, common in the region, do the greatest amount of cropping. The mountain beaver plays a minor role, as apparently do big-game animals also. Artificial reforestation appears to suffer more from animal attack than does natural regeneration. Population counts of animals give unstable readings as

to measurements of damage, because of the ever-present factor of variables." Bibliography of 13 titles.

Food Habits: Nutritional requirements, white-tailed deer

Forbes, E. B., L. F. Marcy, A. LeRoy Voris, and C. E. French. The digestive capacities of the white-tailed dear, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 108-114, 1 pl., 3 tables.

Authors' abstract: "The digestive capacities of the white-tailed deer were found to be in general like those of other ruminants. In comparison with rabbits, deer digest the protein, ether extract, and nitrogen-free extract of concentrated feeds about as do rabbits, but digest the same classes of nutrients in browse more efficiently than do rabbits. Neither deer nor rabbits digest crude fiber efficiently, but deer digest it much more efficiently than do rabbits. The rabbit caecum, therefore, is not the physiologic equivalent of the ruminant paunch. When the digestibility of willow browse, dogwood browse, and acorns was determined by difference between that of a concentrated feed and that of the concentrate plus the browse or acorns, the digestibility of the constituents of the coarse foods appeared to be in all cases low and in several cases had negative values. Winter browse for deer should be regarded as a maintenance, rather than as a highly nutritious, feed. A ration of leafy alfalfa hay 50%, whole corn 45%, and pea-size soy bean oil cake 5%, is satisfactory for deer in confinement. Deer will eat bone meal mixed with salt but their requirements for these products are small."

Food Habits: Rodents eating bone

Carlson, A. J. Eating of bone by the pregnant and lactating gray squirrel, Science (Lancaster, Pa. 15 cents a copy), 91(2372), June 14, 1940, p. 573.

Daily feeding on dried bone suggests an appetite for calcium and phosphorus during pregnancy and lactation. Chicago, Ill.

Food Habits: Rodents eating bone

Coventry, A. F. The eating of bone by squirrels, Science (Lancaster, Pa. 15 cents a copy), 92(2380), Aug. 9, 1940, p. 128.

Red squirrel gnawing twice daily on an old moose skull. Lake Temagami, Ontario.

Food Habits: Rodents eating bone

Woodbury, Angus M. Antler eating by rodents, Science (Lancaster, Pa. 15 cents a copy), 92(2380), Aug. 9, 1940, pp. 127-128.

Probability that mice consume shed antlers. Utah.

Food Habits: Utilization of aquatic plants

Bellrose, Frank C., Jr., and Harry G. Anderson. Preliminary report on availability and use of waterfowl food plants in the Illinois River Valley, Illinois Natural History Survey (Urbana), Biol. Note 15, 14 pp., 5 tables.(mimeographed), 1940.

Field study of the plants and laboratory analyses of stomach contents from corresponding localities were made and index ratings obtained by dividing the percent of use by the percent of abundance. The areas studied are briefly described and possible sources of error discussed. The most serious as concerns the relation of use to availability is that the measure of abundance is that of plants rather than of the parts eaten. For instance, button-bush and American lotus make great masses of vegetation, a very insignificant proportion of which is edible by waterfowl. The same objection applies in the case of all plants of which only the seeds are eaten. The authors rate rice cut-grass and coontail as most valuable among 17 groups, the utilization of which is summarized.

Food Habits: Utilization of Lespedeza

Kistler, J. W. Common lespedeza. An important natural quail food plant, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh, N. C.), 4(12), Dec. 1940, pp. 5-6, 15-16.

Origin, introduction, adaptability, and spread of the plant; vernacular names; value to quail. It made up 29 percent of all the food present in 178 crops and gizzards examined at North Carolina State College.

Food Habits: Utilization of oak products

Van Dersal, William R. Utilization of oaks by birds and mammals, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 404-428, 7 tables.

General review of the value of oaks to wildlife, with particular reference to the utilization of acorns and browse. Records from the literature (7-page bibliography) and other sources tabulated to show feeding on oak products by 186 species of birds and mammals and the number of animals known to patronize 53 species of oaks. The availability of acorns and the desirability of using oaks in plantings for wildlife are discussed.

Food Habits: Of coyote

Grimm, Rudolf L. Trout and crayfish eaten by coyotes, Journ. Mammalogy (Jm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(4), Nov. 1940, pp. 458-459.

In Yellowstone National Park, Wyo.

Food Habits: Of crow

MacArthur, Edward. Poor Jim Crow, Ohio Conservation Bul. (1106 State Office Bldg., Columbus, Ohio. 10 cents a copy), 4(9), Sept. 1940, pp. 12-13.

In urging that the crow is not as black as painted, the author discusses the points of view of the farmer, hunter, and ammunition manufacturer, abstracts the findings of food habits studies, and concludes that the species should have some degree of protection.

Food Habits: Of game birds

English, P. F., and Logan J. Bennett. November foods of ring-neck pheasants and bobwhites, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(6), Sept. 1940, pp. 8-9, 31, 2 figs., 5 tables.

Report on analyses of the food in 84 pheasant and 28 bob-white crops collected during the hunting season of 1939, and comparison with results obtained in 1938. Corn and ragweed hold their places as leaders in the diet of both birds, the former being in first rank for the pheasant and the latter for the quail. Appropriate management suggestions are made. Bibliography of 6 titles.

Food Habits: Of hawk, marsh

Randall, Pierce E. Seasonal food habits of the marsh hawk in Pennsylvania, Wilson Bul. (Gustav Swanson, University Farm, St. Paul, Minn. 60 cents a copy), 52(3), Sept. 1940, pp. 165-172, 3 tables.

Study of the marsh hawk in relation to the ring-necked pheasant, including analyses of 598 pellets. The results are tabulated and discussed for the four seasons and also for the year. Author's summary: "Mice formed the staple food of the Marsh Hawk during 10 months of the year. During June and July juvenile birds were the most important items of food. Many young birds were easily obtained at this season because of their exposure by mowing and harvesting. The effect of Marsh Hawks upon the pheasant population was negligible. There was no reason to believe that the hawks were a limiting factor on the other game species on the study area. The general food habits of the Marsh Hawk are beneficial to man, and this hawk is a decided asset to an agricultural community. Bibliography of 10 titles.

Food Habits: Of heron, blue

Kirkpatrick, Charles M. Some foods of young great blue herons, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 24(3), Nov. 1940, pp. 594-601, 3 figs., 1 table.

Discussion of food of the species as recorded in 6 previous papers. Account of collecting disgorged food at breeding colonies near Trout Lake, Wis-

consin, and descriptions, illustrations, and tabulations based on 297 food specimens. Fishes overwhelmingly predominated, ranged up to 16 inches in length (without head), and included many of game species. Half of them, however, were yellow perch, sometimes regarded as of most value as forage.

Food Habits: Of muskrat

Errington, Paul L. Versatility in feeding and population maintenance of the muskrat, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 68-89.

"Author's abstract: "Data obtained on the food habits of the muskrat (Chiefly Ondatra zibethica in Iowa, 1934 to 1940) indicate that this important fur-bearer may be either selective or highly indiscriminate in its feeding, depending upon opportunities and necessity, individual tastes and habits, and what may perhaps be termed local custom. Certain foods as ear-corn and root-stocks of cat-tails and bulrushes may be both preferred and of superior quality; most green vegetation is more or less adequate as food in warm weather, and populations may winter on dry grass and weeds and cold-blooded prey as frogs, fishes, and mussels; very harsh and innutritious fare, including corn cobs, rotting vegetation, and wood, may also be the principal diet of some animals for varying lengths of time in winter and spring. Because of this versatility in food utilization, muskrats of the agricultural northcentral region are not often subject to rapid or outright starvation. Shortage or unavailability of food in combination with winter vicissitudes, however, may on occasion result in decimation over wide areas, but the check that food deficiencies impose upon muskrat populations appears to be mainly indirect and, to at least some extent, psychological." Bibliography of 28 titles.

Food Habits: Of muskrat

Stearns, L. A., and M. M. Goodwin. Notes on the winter feeding of the muskrat in Delaware, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 1-12, 1 fig., 5 tables.

Review of the literature on food habits and report on a study of nearly 3,000 animals as to the volumes and weights of the stomachs and their food contents. The average volume was 22-23 cc. and weight 1.52 grams; there was no sexual difference in these respects. Chemical analyses were made of composite samples of the animals' stomach contents and of food plants available in their environment. Proportions of crude protein and of ash, significantly higher in the ingested, than in the available, foods, indicated consumption of a notable amount of animal matter. Bibliography of 11 titles.

Food Habits: Of owl, barn

Blakemore, Lem A. Barred owl food habits in Glenwood Park, Minneapolis, Minn., The Flicker (University of Minnesota, Minneapolis, Minn.), 12(3), Oct. 1940, pp. 21-23, 2 tables.

Report on contents of 36 pellets in which shrews and meadow mice were the items most frequently identified. No game bird remains were present; unusual items were skink and crayfish.

Food Habits: Of owl, burrowing

Scott, Thomas G. The western burrowing owl in Clay County, Iowa, in 1938, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 24(3), Nov. 1940, pp. 585-593, 1 pl., 2 tables.

General notes on the species and on 3 families studied; discussion of the food based chiefly on the contents of 250 pellets which are tabulated. The food items of most frequent occurrence were scarabaeid beetles, grasshoppers, and white-footed mice. Bibliography of 13 titles.

Food Habits: Of owl, horned

Errington, Paul L., Frances Hamerstrom, and F. N. Hamerstrom, Jr. The great horned owl and its prey in north-central United States, Iowa Agr. Expt. Station (Ames), Research Bul. 277, pp. 758-850, 4 figs., 12 tables, Sept. 1940 (Oct.)

Excellent report on a long-continued study that was extensive with respect to material (more than 4,800 pellets for one item) and intensive as to area and methods. The food habits of the owl are treated exhaustively as to trends in food utilization by seasons. Predation upon the principal groups of food animals is discussed in relation to their availability and as to its effects upon economically significant species. Rabbits, hares, and mice were the staple food items. There is an extended general discussion of predation by the great horned owl, including exposition of its relation to overpopulations of the bob-white and ruffed grouse; of its place in the combined activities of all predators--"a cross-play of predation, variable in source but compensatory in net effect"; of its relation to availability of prey; and of its effect upon prey populations. There is a bibliography of 119 titles, and an appendix giving details of the results of family and special phase studies of horned owl food habits.

Food Habits: Of owl, horned

McDowell, R. D. The great horned owl, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(8), Nov. 1940, pp. 10-11, 29, 2 photos, 1 map, 2 tables.

One table summarizes the weights and measurements of mature birds, some 800 of which were males and some 700 females. Averages for the sexes, respectively, were: Weight (lbs.) 2.8, 3.7; wingspread (inches) 52.8, 56.2; and length (inches) 21.3, 22.6. A second table presents the results of analysis of 983 stomachs. Leading items are rabbits, mice, rats, and poultry.

Food Habits: Of pelican, white

Bond, Richard M. Birds of Anaho Island, Pyramid Lake, Nevada, Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 42(5), Sept.-Oct. 1940, pp. 246-250, Figs. 70-73, 1 table.

Annotated list of the birds with special discussion of the food habits of the white pelican and comparison of the results with those of E. Raymond Hall's investigation for the Biological Survey in 1924. "Now, as at the time of Hall's visit, local residents are convinced that the pelicans are seriously affecting the fishing in the lake." Then it was trout, now it is another species, but the charge seems no better founded.

Food Habits: Of raccoon

Giles, LeRoy W. Food habits of the raccoon in eastern Iowa, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 375-382, 1 table.

Author's abstract: "From Mar. 23-Dec. 7, 1938, 333 scats and 2 stomachs were collected in Dubuque Co., most of them on rock bluffs in which the raccoons denned. These were analysed for volume and frequency of occurrence of food materials. The food habits for the 9-months' period were separated into 4 divisions on the basis of predominating foods. 1. (Mar. 23-Apr. 16). Corn made up 78.99% of the fecal vol. for this period. Minor foods were crayfishes and small vertebrates. 2. (Apr. 19-June 20). Grass formed 37.09% of the total vol. and probably served as a tonic food. Insects, which made up 35.07%, were principally beetles (notably Phyllophaga spp.) and cutworms (Nephelodes emmedonia). Other food remains were hickory nuts, crayfishes, corn, vertebrates, and snails. 3. (June 20-Aug. 11). Wild raspberries (Rubus occidentalis and R. strigosus) were characteristic summer food. Their seeds were present in 54.54% of the scats and made up 32.17% of the vol. Of less importance were beetles, corn, gooseberries, vertebrates, and wild strawberries. 4. (Aug. 11-Dec. 7). Corn formed 85.19% of the food remains by vol. Its consumption increased during the fall until it was taken almost exclusively. Insects, especially grasshoppers (particularly Melanoplus femur-rubrum and M. differentialis) and to a less extent carabids, Polistes wasps, and hellgramites were represented in large numbers. Crayfishes, vertebrates, and misc. items were of comparatively small volumetric importance. The identifiable vertebrates eaten during the entire period included 5 fishes, 3 amphibians, 1 lizard, 7 snakes, 1 prairie mole, 23 rodents (largely mice), 19 small birds, and 1 young raccoon. Results of this study indicated that the raccoon has definitely vegetarian tendencies. Fully 77.73% of the combined fecal and stomach materials was of plant origin, while only 22.27% was animal."

Food Habits: Of robin

Hamilton, W. J., Jr. Summer food of the robin determined by fecal analysis, Wilson Bul. (Gustav Swanson, University Farm, St. Paul, Minn. 60 cents a copy), 52(3), Sept. 1940, pp. 179-182, 1 fig., 1 table.

Brief review of reports on the food habits of the robin which are most deficient with respect to the summer period. The author suggests that this deficiency can be made up by study of droppings. Results from analysis of about 700 of them are tabulated and discussed. In frequency of occurrence, beetles, cutworms, and ants lead among animal, and raspberries, blackberries, and wild cherries among the vegetable, foods. Bibliography of 5 titles, to which could be added a paper in The Auk, 57(3), July 1940, pp. 334-348, giving information on the food of birds derived from study of the contents of nest boxes.

Food Habits: Of starling

Dermon, E. L. 19th Annual Report, Southern Forest Expt. Station (New Orleans, La.), 1939 (1940), p. 24.

Starlings visiting longleaf pine forests in increasing numbers threaten great damage by consuming the seeds. Birds of several kinds now combine to make plantings futile.

Food Habits: Of turtle, snapping

Pell, S. Morris. Notes on the food habits of the common snapping turtle, Copoin (M. Graham Netting, Carnegie Museum, Pittsburgh, Pa. 75 cents a copy), 1940(2), July, p. 131, 1 table.

Contents of 18 specimens from New York and New Jersey tabulated according to percentages of frequency and of bulk. Plant material comprised nearly 53 percent by volume; the largest item of animal food was crayfishes.

Food Habits: Of weasel, long-tailed

Polderboer, Emmet B., Lee W. Kuhn, and George O. Hendrickson. Winter and spring habits of weasels in central Iowa, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 115-119, 1 pl., 2 tables.

Authors' abstract: "On 160 acres, typical of central Iowa farm land, by using 100-yard inventory strips in fresh snow and noting the trails crossed, 4 long-tailed weasels (Mustela frenata) and 1 considered as a least weasel (M. rixosa) were found. The average cruising radius of the long-tailed weasel was 25 rods. The preponderance of the weasel diet was mammalian, chiefly murine, with the genus Microtus most important, as shown by examination of 131 scats and debris of 3 den nests. A covey of 24 bob-whites (Colinus v. virginianus) and 14 ring-necked pheasants (Phasianus colchicus torquatus) often seen on the area were not harmed by the weasels in 5 months of observation. Of 10 cottontails (Sylvilagus floridanus mearnsii) lost from an estimated 35 at the start, 2 were known to have been taken by weasels, 2 by dogs, and 3 by hunters. Cannibalism occurred among the weasels as evidenced by least weasel remains in scats of a long-tailed weasel; this may indicate interspecific strife as a possible limiting factor in weasel populations. The known range of the least weasel is extended to include Story County, Iowa."

Food Habits: Of wild turkey

Good, Henry G., and Lloyd G. Webb. Spring foods of the wild turkey in Alabama, American Wildlife (Investment Bldg., Washington, D. C. 25 cents a copy), 29(6), Nov.-Dec. 1940, pp. 283-290, 1 table.

Report on analyses of the food of 116 birds. It was nearly nine-tenths vegetable, of which the predominant item was oak products--acorns, leaves, and catkins. Other prominent foods were seeds of Nyssa, fruits, buds, and twigs of beech, berries of dogwood, and nuts and flowers of hickory. The animal food was chiefly insects. Competition between deer and turkeys is not severe but hogs should be removed from areas being developed for turkeys. Other management suggestions are made.

Introductions: Elk, Arizona

Kartchner, K. C. Elk introduction to Arizona, Arizona Wildlife and Sportsman (125 North 2nd Ave., Phoenix, Ariz. 15 cents a copy), 2(5), Aug. 1940, pp. 2, 11.

The native Arizona wapiti or Merriam's elk was exterminated by meat and trophy hunters, the last animal being killed in 1898. Introductions of Rocky Mountain elk, begun in 1913, proved so successful that an open season was permitted in 1935. Details are given of the various transplantings. Crop damage by the animals is increasing and the electric fence is being tried as a remedy.

Introductions: Elk, Minnesota

Swanson, Gustav. The American elk in Minnesota, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 1(2), Nov. 1940, pp. 5-7, 1 pl.

History of the elk in Minnesota where it was completely extirpated by 1900; natural reinvasion of the State is indicated by a 1932 record. Efforts at introduction began in 1913 but actual release in the wild did not occur until 1935. The animals have increased to about 100 and the future looks promising.

Life Histories: Beaver

Cook, Fannye A. Beaver study reveals damage to timber, corn only negligible, Mississippi Game and Fish (Mississippi Game and Fish Commission, Jackson), 4(12), Dec. 1940, p. 4.

Trees cut are small and of little value. Damage by feeding on corn and by flooding lands is seldom so extensive as to cause complaint. Conditions for fishes and wildfowl have been improved. Native beavers show a decided preference for small streams and introduced animals seek such places if not put there at first. The paper contains notes on dams, dens, lodges, activities, foods (20 plants listed), and breeding.

Life Histories: Chipmunk, Long-eared

Holdenried, Robert. A population study of the long-eared chipmunk (Eutamias quadrimaculatus) in the central Sierra Nevada, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(4), Nov. 1940, pp. 405-411, 1 fig., 2 tables.

Description of study area in Madera County, California, and of the trapping and marking methods employed. Catches and variations in numbers of the animals trapped are tabulated. The sex ratio was even. Males had a greater cruising radius than females. There are notes on food habits and trap mortality. Bibliography of 5 titles.

Life Histories: Goose, Snow

Howard, Wm. J. Wintering of the greater snow goose, The Auk (Rudyard Boulton, Field Museum, Chicago, Ill. $1.00 a copy), 57(4), Oct. 1940, pp. 523-531.

Notes on the extent and nature of the winter range in Virginia and North Carolina, and upon numbers, migrations, local movements, and feeding habits of the geese; discussion also of the ratio of adult to immature birds; occurrence of blue geese, predators, and protection and management. Bibliography of 10 titles.

Life Histories: Kangaroo rat, Santa Cruz

Hawbecker, Albert C. The burrowing and feeding habits of Dipodomys venustus, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(4), Nov. 1940, pp. 388-396, 1 pl., 1 fig.

Vegetational and other characteristics of the study site in Santa Cruz County, California, are described. Excavation of 15 dens yielded information as to their relatively simple nature and as to intruders. In ditch berms, dens were an erosion hazard but were easily eliminated by light disking. The food was chiefly annual seeds which were stored in both underground and surface caches. Various food plant species are named, the most important, however, under only vernacular names. The animals were harmful to crops at sowing time. Bibliography of 6 titles.

Life Histories: Mouse, Meadow

Allen, Durward L. Millions of little teeth, Michigan Conservation (Michigan Dept. of Conservation, State Office Bldg., Lansing, Mich.), 9(11), Sept. 1940, pp. 6-7, 10, 4 figs.

Chiefly on the food habits and life history of the meadow mouse (Microtus pennsylvanicus). Instances of damage to alfalfa, plantings of timber and ornamental trees, and orchards. Notes on life history and on natural enemies. "If we are going to profit by the immeasurable good done by these animals x x x we x x x have to put up with some of the things we may not like. There is a limit

to how much we can regiment nature." Good management requires skillful utilization, not elimination, of predators. Bibliography of 5 titles.

Life Histories: Pheasant, Ring-necked

Nelson, Urban C. Winter observations on pheasants in southeastern Minnesota, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 369-372, 4 tables.

Description of the area and of the writer's observations and analysis of the latter. Author's summary: "Deficiency in food and cover resulting in a high winter mortality is considered the limiting factor in the management of ring-necked pheasants in southeastern Minnesota. A field analysis, although based on relatively few observations on range with a low pheasant population, indicates the dependence of the birds on farm windbreaks, corn, and barnyard foods during the winter months. The value of the farm windbreak as cover is great on prairie land where standing corn provides food. Barnyard foods are of most value in areas where brush and woodland cover is available and there is a scarcity of standing corn. Improved management of the ring-necked pheasant should add better winter cover; planting of coniferous and hardwood cover in small areas well distributed over the farm would help. Feeding seems to be the principal activity of pheasants during daylight hours. Cocks have a nomadic tendency and often travel alone, while hens have a relatively short cruising radius and are more prone to flock."

Life Histories: Pheasant nesting, Ohio

Strode, Don M., and Daniel L. Leedy. The 1939 pheasant nesting study in Wood County, Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus) Release 135, 20 pp., 1 map, 14 tables (mimeographed), 1940.

The methods of the study are described and its results compared with those of previous years are tabulated in detail and discussed under a variety of heads. The average number of nests on 4 sections was 141; 58 percent of the nests were successful; the average hatch was 659 per section or slightly more than one per acre; the percentages of nests found and of those that succeeded were highest in sweetclover seed fields and in hay crops; the average number of eggs per clutch was 8.8; size of clutch decreased through the season; "Of 210 nests destroyed in all types of cover, 75.2% were destroyed by man, 12.4% by bird predators, 5.7% by mammalian predators; 1.9% by livestock, 1.0% by desertion, and 3.8% by unknown causes; of 24 incubating hens known to have been killed, 22 were killed by mowers and 2 by binders; the most successful nestings were those of the last 10 days of May and the first 10 days of June (time based on date first egg was laid); pasturing had but little apparent effect on pheasant nesting in woodlots, as there were 12.0 nests per 100 acres of unpastured woodlots and 12.2 per 100 acres of pastured woodlots. The percentage of nests that were successful was high in both types--64.3% in pastured woodlots, and 65.0% in unpastured woodlots; pheasant nesting success was somewhat lower near the field borders, possibly due to earlier cutting of field crops and to the use of

fencerows as travel lanes by predators; although the greatest percentage of nests (27.5%) was found within 50 feet of field borders, the nesting density (number of nests per 100 acres of cover), was greatest 151 to 200 feet from the edges of fields."

Life Histories: Redhead

Low, Jessop B. Production of the redhead (Nyroca americana) in Iowa, Wilson Bul. (Gustav Swanson, University Farm, St. Paul, Minn. 60 cents a copy), 52(3), Sept. 1940, pp. 153-164, 4 photos, 1 table.

Study at about the southern limit of the breeding range of the redhead as to its nesting habits, nesting cover, nest construction, juvenile rearing cover, and reproduction. Of 42 nests under observation, 23 were successful; only 38 percent of the eggs, however, produced young. Changing water level was the greatest destructive factor; infertility and desertion of eggs also were of importance. There was one nest to 16 acres of vegetative cover, and a production of 3.8 young to each pair of redheads. Bibliography of 10 titles.

Life Histories: Squirrel, Flying

Solberger, Dwight E. Notes on the life history of the small eastern flying squirrel, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(3), Aug. 1940, pp. 282-293.

Glaucomys v. volans. Observations on habitat, means of detecting the presence of flying squirrels, time of activity, degree of inactivity in winter, movements, voice, food, and temperament. Bibliography of 23 titles.

Life Histories: Squirrel, Fox

Baumgartner, Luther L. The fox squirrel: Its life history, habits, and management in Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus) Release 138, 7 pp. (mimeographed), 1940.

Condensation of a Doctor's thesis (of 257 pages, with a bibliography of 55 titles, and with 36 illustrations). Distribution and habitat are stated; more than 2,200 squirrels were examined; average weight of 143 adults was 793.5 grams (1.75 lbs.); average measurements of 62 adults are given, as well as information on the reproductive cycle ("true" sex ratio 52.56% male, average young per litter 3.23), food habits, movements, population levels (5-year average per 100 acres 90.2), mortality factors with considerable detail as to hunting, and management recommendations.

Life Histories: Toad

Bragg, Arthur N. Observations on the ecology and natural history of Anura. II. Habits, habitat, and breeding of Bufo woodhousii woodhousii (Girard) in Oklahoma, American Midland Naturalist (University of Notre Dame, Ind. $1.00 a copy), 24(2), Sept. 1940, pp. 306-321, 1 fig. (map).

Range, habitat, and habits, especially the breeding activities, and factors limiting numbers. Comparisons with B. cognatus. Bibliography of 31 titles.

Life Histories: Woodchuck

Moss, A. E. The woodchuck as a soil expert, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 441-443, 1 chart.

Author's abstract: "A detailed soil survey of a small woodland area offered opportunity to check the occurrence of woodchuck burrows in respect to topography, soil series, and types. There appeared to be very little relationship between topography or series but a close correlation between the occurrence of sandy loam and the burrows."

Life Histories: Wood rat

Vorhies, Charles T., and Walter P. Taylor. Life history and ecology of the white-throated wood rat, Neotoma albigula albigula Hartley, in relation to grazing in Arizona, University of Arizona (Tucson), Tech. Bul. 86, pp. 455-529, 8 pls., 7 figs., 8 tables.

Description, illustration, measurements, and weights of the animal are given, and its distribution, habitat, and habits are discussed. Under the latter topic are included statements of daily and seasonal activity, extent of home range (minimum 1/20 acre), sex ratio (nearly even), breeding season and rate (average number per litter 1.95), sex behavior, the young, dens, nests, and food and food habits. Cactus, mesquite, and grasses supply most of the vegetable food and ants are the largest item of animal sustenance. Den intruders, parasites, predators, and diseases are considered and population phenomena are discussed. Economic status is treated with respect to injurious, neutral, and beneficial effects of the wood rats. Control should be selective, individuals being disposed of wherever they are a definite nuisance. "But a general wood rat killing campaign on the open range would do no appreciable good to range forage. On the other hand, it would distract attention from the real cause of most difficulties encountered in the arid country--namely, too many livestock for the actual carrying capacity of the range." Bibliography of 31 titles.

Life Histories: Wood rat, Allegheny

Poole, Earl L. A life history sketch of the Allegheny woodrat, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(3), Aug. 1940, pp. 249-270, 2 pls., 2 figs., tables.

Neotoma magister. Combined records from the literature and from correspondents, and notes on observations on the animals both in the wild and in captivity, presented under the heads of: Distribution, nests, food, use of water, sanitation, enemies, parasites, diseases, pelage and molt, adaptations, social life, and breeding and general habits. Bibliography of 25 titles.

Management: Attracting birds

Beattie, W. R. Useful and ornamental gourds, U. S. Dept. of Agriculture Farmers' Bul. 1849 (Supt. of Documents, Washington, D. C. 5 cents a copy), 13 pp., 8 figs., 1940.

Two pages (10-12) of this publication present an illustration of gourds in use for bird houses and text on the subject contributed by the Biological Survey; the bulletin supersedes U. S. D. A. Leaflet 36, "Gourds for bird houses and other purposes," 1929.

Management: Bears in national parks

Finley, Wm. L., and Irene Finley. To feed or not to feed--that is the bear question in Yellowstone National Park, American Forests (919 Seventeenth St., Washington, D. C. 35 cents a copy), 46(8), Aug. 1940, pp. 344-347, 368, 383-384, 7 photos.

Popular article on the park bears, their habits, and treatment. Pampering has made the bears tame but all the more dangerous. The authors conclude that the public as well as the park officials should abide by the stated policy that, "Presentation of the animal life of the parks to the public shall be a wholly natural one. No animal shall be encouraged to become dependent upon man for its support."

Management: Bob-white

Baker, Rollin H. Better quail shooting in east Texas, Texas Game, Fish, and Oyster Commission (Austin), Bul. 20, 18 pp., 10 photos, Sept. 1940.

Management suggestions for sandy land, longleaf pine woodland, blackland, and coastal prairie. For all areas the kill should be limited to a third of the fall supply and that should be ascertained by careful census. Plans are advanced for low-cost, and for intensive, management of each of the land types, and they relate to food, cover, burning, grazing, and predator control. Bibliography of 6 titles.

Management: Bob-white

Lay, Daniel W. Bob-white populations as affected by woodland management in eastern Texas, Texas Agr. Expt. Station (College Station), Bul. 592, 37 pp., 13 figs., 4 tables, 1940.

A satisfactory drive method of enumerating the birds is described and the results tabulated for cut-over areas in different stages of succession. The density of the quail population is greatest about 9 years after logging and rapidly declines with further growing up of the forest. The effects of lumbering arise from changes in cover and food plants that are discussed for the types of woodland and stages of succession. A tabulation is given of the food items identified from 56 bob-white stomachs collected in Walker and Trinity counties, both volume and frequency of occurrence being noted; Lespedeza and

Croton head the list. Management procedures suggested by the study deal with the establishing of headquarters food and cover patches, with brush cutting, plowing, burning, and grazing, and with the control of predators, regulation of hunting, and restocking. There is a summary and a bibliography of 7 titles.

Management: Bob-white

Stoddard, Herbert L. Cooperative Quail Study Association (Thomasville, Ga.) Eighth Ann. Rep., 27 pp., Aug. 1940.

In addition to information of interest chiefly to members, this leaflet contains comment on controlled fire as a tool in upland game management, on the improvement and maintenance of woodlands in relation to wildlife, effects of drought and of excessive rainfall on quail production, experimental and practical work with game food plantings, quail numbers and food supply, and on mammals, fire ants, and diseases in relation to quail.

Management: Deer, Pacific white-tailed

Scheffer, Victor B. A newly located herd of Pacific white-tailed deer, Journ. Mammalogy (Wm. B. Davis, A. & M. College, College Station, Texas. $1.00 a copy), 21(3), Aug. 1940, pp. 271-282, 1 pl.

Odocoileus virginianus leucurus. A group previously believed to have been extirpated is reported from the same locality where recorded by Lewis and Clark in 1806 near the mouth of the Columbia River. Notes are given on distribution and numbers of the deer in both Washington and Oregon, on their food supply and food habits, mortality, and parasites. There are about 500-700 of the animals but they are destructive to crops and may act as a reservoir of livestock diseases. It is suggested that the herd be moved to a lowland area less used for agriculture. Bibliography of 7 titles.

Management: Deer, White-tailed

Aldous, Shaler E. Deer management suggestions for northern white cedar types, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941. pp. 90-94, 2 figs.

Author's abstract: "Northern white cedar is one of the most desirable browse species for white-tailed deer in the Lake States Region, but because of excessive browsing, fires, and logging operations, has become progressively less available to the animals. To promote best utilization of the cedar now present but largely out of reach of deer, studies were made to determine the relative quantities of browse that various-sized trees produce, and the degree of browsing that can be permitted without depleting the annual output. Curves are given for computing the available browse from small living trees, from larger trees up to the seven-foot line, and from larger trees felled during logging operations, or cut expressly for deer. If browsing is kept below 25% of the leafy foliage annually, the smaller trees are potentially the best food producers as most of the foliage is within reach of deer. Only the lower

branches of larger trees can be browsed and the new growth is largely out of reach. Priority usage of winter concentration areas for deer and management to that end are advocated. White cedar sprays used in the floral market remove a large amount of browse from the forests, but the direct effect upon deer is not serious because these sprays can only be found in profitable quantities where deer are relatively scarce."

Management: Deer, White-tailed

Krefting, Laurits W. Methods of increasing deer browse, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 95-102, 1 pl., 1 fig.

Author's abstract: "Two sorts of cutting to induce sprouting, the 'ground-line' and 'snow-line' methods, were experimented with in the Superior National Forest, northeastern Minnesota, over a 5-year period. Twenty-eight browse-study plots were established in which trembling aspen (Populus tremuloides), paper birch (Betula papyrifera), beaked hazel (Corylus cornuta), red-osier dogwood (Cornus stolonifera), and honeysuckle (Lonicera canadensis) were cut at the ground and snow levels to stimulate sprout growth. To facilitate comparison of productivity by both methods of treatment, the annual growth was clipped from treated and untreated samples between the ground level and 7 feet, weighed, and measured for length. A total of 40,656 stems were used. Costs ranged from $4.92 per acre in shrub types cut at the snow-line to $15 per acre in tree types cut at the same level. On a weight basis, red-osier dogwood ranked first and honeysuckle last, while on a length-of-growth basis trembling aspen was first, red-osier dogwood second, and mountain maple third. Practical application of the findings should avoid trembling aspen and paper birch and center on shrubs, particularly the mountain maple, and on the ground-line method of treatment. To obtain the desired results the forest canopy must be kept from shading out the desirable shrubs." Bibliography of 9 titles.

Management: Environmental improvement

Engelking, Truman G., and Ellis A Hicks. Iowa's wildlife packet, Iowa State College (Ames), Cooperative Extension Service, F 206, 6 pp., 2 pls., 1 table (mimeographed), 1940.

The value of aid to wildlife in winter is pointed out and as a contribution to that end the cooperators have arranged to supply at nominal cost ($1.00 plus transportation charges) packets containing 200 plants (enough for 1/4 acre at the recommended spacings) suitable for environmental improvement. Plans and suggestions for the planting are given, and the importance of installing feed patches also is stated. The form includes information on restrictions as to use of the packets and an application blank.

Management: Environmental improvement, marshes

Scott, Thos. G., and W. L. Dever. Blasting to improve wildlife environment in marshes, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 373-374, 2 pls.

Authors' abstract: "Marshes choked with rank growths of vegetation are a monotonous cover type subject to improvement by clearing operations, including the use of dynamite. The desired edge-effect and economical use of the explosive can be obtained by blasting ditches by the propagation method. The most successful excavations were made over hard pan sub-strata where the combined depths of soil and water above the hard pan did not exceed five feet. Charges were laid on a line at 18-inch intervals where there were less than 3 cartridges to a place, and at 24-inch intervals for heavier charges. As to depth, loads of one stick were used for 2.5 feet, 2 sticks for 3.5 feet, and 3 sticks for 4.5 feet of soil and water, respectively. The result of a properly placed blast was a ditch 9 to 12 feet wide of the desired length. Depth was limited by the hard pan. Excavations were attempted in deep, soft peat and muck with unsatisfactory results. It is probable that further experimentation will yield modification of the technique that will make it applicable to a variety of conditions."

Management: Farm game

Davison, Verne E. Better farming methods bring back wildlife, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Blacksburg. 10 cents a copy), 4(1), Autumn 1940, pp. 16-20, 4 photos.

A pressing problem for wildlife conservationists is "that of finding effective measures of habitat improvement which are acceptable to the average farmer." To be acceptable they must accord with the interests of the farm family, add no economic burden, and harmonize with farm practices. In view of their respective connotations, the author prefers the expression producer-consumer to farmer-sportsman. He suggests interests that farmers have in wildlife and refers to efforts of the Soil Conservation Service to encourage agricultural methods that benefit game incidentally to improvement of farm management. The Soil Conservation Districts are widely adopting plans including wildlife measures and farm groups whose cooperation should be sought by those interested primarily in wildlife.

Management: Farm game

Hill, R. G., and G. W. Bradt. Producing wildlife by good farm land use, Extension Bul. Michigan State College (East Lansing), 218, 23 pp., illus., Dec. 1940.

Every farming activity influences wildlife and on account of the value of this life can well be modified to favor it. Suggestions are made as to the management of the farm wood lot, marshes, swales, and ponds, waste areas, cultivated fields, and windbreaks. Also discussed are the provision of food for wildlife, the control of hunting, and an educational program. The bulletin includes numerous references to allied publications and is copiously illustrated with excellent photographs.

Management: Farmer-sportsman relationship

Benjamin, J. R. State supervised hunting in Ohio in 1939, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 136, 19 pp., 4 figs., 15 tables (mimeographed), 1940.

Second annual report covering an area of 180,000 acres, and the activities of 6,819 hunters (not including farmers and their guests). Author's summary: "(1) After only two years of trial, supervised hunting has proved itself as a satisfactory method of solving the farmer-hunter problem. Regulated hunting is doing away with farmer-hunter friction by ostracizing the outlaw hunter. The farmer is obtaining the protection he is entitled to and the law-abiding hunter is finding a place where he can enjoy his hunt without fear of inadvertently trespassing if he merely stays within well-defined boundaries. In two years' experience with the supervised hunting plan, we have yet to hear of a single instance of property damage, livestock injury, or personal danger to any landowners or farm personnel. (2) The plan can and should be enlarged as rapidly as personnel can be trained to place new areas in operation. Old areas can be enlarged to help lessen hunting pressure, and new ones can be organized for demonstration purposes. (3) The plan should be safeguarded against the profit motive by the Conservation Division's insisting that those areas which charge for hunting limit their fees to just enough to pay the cost of operation. Any time any group starts operating for profit, the Division should withdraw all support from them; do no restocking, furnish no food patch seed, winter feed, area signs or permit tags, and refuse to commission their temporary game protectors and patrolmen. From all the information we can gather, the trend among the associations is to lower their rates in line with the Division's non-profit policy rather than to increase them. (4) It is absolutely requisite to the success of the plan that the hunting pressure be limited to what the game population will carry. The supervisor's first interest should be the game crop and its continued reproduction rather than the entertainment of a maximum number of hunters. A daily hunting pressure limit of not more than one hunter to thirty acres, should be rigidly enforced, and even a hunting pressure this dense should be kept as widely scattered as possible, to avoid possible danger. This limit must include farmers and their guests. The area seasons should be limited to that length which will permit only the harvest of the game surplus without cutting into next year's brood stock. This can be done either by shortening the area hunting season, limiting the number of hunters, by limiting the game bag, or by using all three control measures. (5) Supervised hunting may be modified in detail as necessity arises, but the general plan now in use in Ohio is the most satisfactory of any of the plans on which information has been obtained."

Management: Farmer-sportsman relationship

Bump, Gardiner. Unlocking the trespass gate, Outdoor America (1167 Merchandise Mart, Chicago, Ill. 10 cents a copy), 5(11), Sept. 1940, pp. 6-8, 2 photos.

Discussion of widely experienced difficulties in the farm hunting situation, and of the causes for failure of numerous attempts to relieve them. Tak-

ing these factors into consideration, the New York Conservation Department tried a new plan in 2 projects the first year which proved successful enough to encourage the addition of 5 others this season. These experiments involve the leasing by the State of hunting rights over sizeable acreages at 10 cents per acre, posting and patrolling also by the State, restocking and winter feeding in cooperation with sportsman's and 4-H clubs, furnishing seeds for food patches and paying $10 per acre for putting them in. The total cost per acre averaged 32 cents, which, it is thought, can be reduced in other years and on larger acreages. Regulations under which hunting was permitted and requirements for the establishment of additional public hunting grounds of this type are reported.

Management: Food patches

Mason, Edwin A. Wildlife food plants in New England, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 392-397.

Author's abstract. "Summary of experiments over a 5-year period with seed-producing plants for wildlife food strips at Groton, Massachusetts. It was found impossible to reliably mature sorghums, cowpeas, field corns, and hemp when sown broadcast in mixtures. Buckwheat, German, Japanese, and Proso millets, flax, soy bean, Sudan grass, sunflower, and Vicia sativa, have value for the purpose. Thin stands are desirable; 20 to 25 lbs. per acre is recommended. Adulteration of the seed mixtures with sawdust prior to sowing ensures more even stands. A combination of sunflower and Vicia sativa showed promise as a wildlife winter food mixture, as did also one of buckwheat and sunflower. The popcorn strains of Zea mays have much to offer as wildlife food plants. Tubers of Helianthus tuberosus freeze and spoil too quickly to be of value as a winter food. Observations pointed to 2 tree species, Catalpa catalpa and Cladrastris lutea, as possible wildlife food plants. Because of certain peculiar New England conditions, broadcast sowing experiments, although from a cultural standpoint less desirable, should be continued." Bibliography of 5 titles.

Management: Feed patches

[Stoddard, Herbert L.]. Fall combination plantings, Cooperative Quail Study Assoc. (Thomasville, Ga.), Management Leaflet 1, 6 pp. (mimeographed), Sept. 1940.

Mixed plants of Augusta Vetch, Wild Winter Pea, and fall grains have been found valuable in the Southeast in supplying food for quail and other game during the critical season of early spring. This leaflet describes the component plants, recommends the proportions in which their seeds should be used, and gives explicit directions as to inoculation of the legumes, rate of seeding, fertilization, planting, and maintenance.

A timely reminder that game management to a vital degree is plain dirt farming.

Management: Game cooperatives

Hill, Russell G. Some observations on farm game management cooperatives in Michigan, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 383-391, 2 charts, 3 tables.

Author's abstract: "Farm game management cooperatives have been in operation in Michigan for ten years with the State Department of Conservation assisting during the last four. During this period the number of organizations has increased from one in 1936 to 110 in 1939, involving 500,000 acres at a cost to the Department of about a cent per acre. Protest against local hunting trespass conditions stimulated the movement but game management is practiced and other far-reaching values result from these organizations. These cooperatives are farmer initiated and operated and great variation in the rules and regulations is found. In order to receive cooperation from the Conservation Department, certain requirements as to size of area, participation by farmers, and distribution of permits must be met. A small mortality of these cooperatives has resulted chiefly from lack of harmony between farm members, a fault that cannot be controlled by outside interests. Participation in this work by the Conservation Department and the Extension Division of Michigan State College is considered to be generally satisfactory to both farmersand city hunters."

Management: Harvesting squirrels

Chapman, Floyd B. The squirrel harvest on Ohio public hunting preserves, 1939, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 142, 8 pp., 1 fig., 5 tables (rimeographed), Aug. 1940.

Continuation of a series of reports on the subject that have been noticed in several previous issues of WILDLIFE REVIEW. New features are: Addition of a privately-owned game management area to those under control; establishing checking stations at rural stores and at homes of fire wardens and other local residents; and paying a fee of 5 cents for each permit issued. Experience confirmed previous evidence of an approximate 5-year cycle in the numbers of gray squirrels which were again at a high level in 1939. A graph shows the number of hunters, number of squirrels seen, and the kill for each day of the open season. Tables summarize information on the number of hunters and of squirrels seen and killed on the 7 management areas; the kill per day and per thousand acres in each year since 1935; the sources of hunters visiting the controlled shooting grounds; and the gray squirrel-fox squirrel ratio on the 7 areas studied in 1939 (average 80 to 1). Bibliography of 23 titles.

Management: Harvesting statistics

Gordon, Seth. An analysis of methods used to collect game-kill statistics, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(8), Nov. 1940, pp. 4-5, 22-23, 30-31, 5 figs., 2 tables.

Sampling techniques and general observations of field workers give a fairly safe guide for procedure a season at a time. The game harvest may be even more accurately ascertained and the results, particularly over periods of years, are of inestimable value to the wildlife administrator. The methods used by 27 commonwealths, including states, territories, and Canadian provinces, are briefed and the Pennsylvania system more fully expounded. After considerable experience, it was learned that simple hunter reports, promptly returnable under compulsion of a low penalty, delinquents being visited by wardens, resulted in practically complete returns. Other administrations are urged to adopt similar arrangements so that comparable statistics will become available. Tables show the Pennsylvania kill for 5-year periods since 1915, based chiefly on estimates, and for the last three years calculated from 93 to 98.5 percent complete reports.

Management: Herd regulation

Fredine, Gordon. Minnesota's deer problem, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 1(2), Nov. 1940, pp. 18-23.

Cutting of the hardwood forest enabled the white-tailed deer to extend their range and to increase, finally to such a number that they depleted their food supply. Counts from 1935 to 1939 showed that the animals have been gradually decreasing. The limiting factor is the carrying capacity of winter "yards" and more deaths are due to malnutrition than to hunting. Hunting can and should be used as a tool to control the deer population.

Management: Inventory, gannets

Fisher, James. The world's gannets, The Field (114 Fleet St., E. C. 4, London, England. One shilling a copy), 176(4575), Aug. 31, 1940, pp. 276-278, 5 photos, 1 map, 2 tables.

Location of colonies and numbers of these birds for the world in 1939; total 167,000. Information on the rookeries fullest for those about the British Isles.

Management: Inventory, pheasant

Hicks, Lawrence E., and Daniel L. Leedy. The 1940 September pheasant survey, Ohio Wildlife Research Station (Ohio State University, Columbus), Release 145, 23 pp., 1 fig., 17 tables (mimeographed), 1940.

The technique of this population survey is described and the results discussed and tabulated from a number of points of view and summarized in the tables and in 30 brief paragraphs, indicative features of which are here further noticed. Average population per square mile, 91 (less than in 1938 and 1939); sex ratio of adults seen, 28.8 cocks : 71.2 hens; of juvenile birds, 46.6:53.4; of the entire population, 42.1% were cocks; mortality on highways 9.19, and on railroads, 360 birds per 1,000 miles; for every 100 pheasants there were seen also 14.1 bob-whites, 4 rabbits, 1.4 Hungarian partridges, 226 crows, and 7.9

hawks; favorite habitats were pasture, meadow stubble, and corn and soy bean fields; of 3,096 birds 80.6 percent were young; of 580 hens, 74.7 were with young; 444 broods averaged 5.6 individuals; average loss caused by mowing alfalfa fields, 46 nests, 40 pheasants killed, and 24 crippled per 100 acres. Bibliography of 24 titles.

Management: Planting for wildlife and erosion control

Davison, Verne E. Shrubs for wildlife on farms in the Southeast, U. S. Dept. Agr. Leaflet 200 (Supt. of Documents, Washington, D. C. 5 cents a copy), 7 pp. (unnumbered), 10 photos, 1940.

Putting shrubs in the right place or leaving them there is the first principle of their management on the farm. Wildlife borders, partly of shrubs, partly of herbs, are useful in separating forest and field and in preventing encroachment of woodland upon cultivated ground. Their construction and management are described. The use of shrubs for borders of tree plantations and for hedges is discussed. Waste areas on the farm as marshes, steep slopes, rock outcrops, and banks of streams and ditches can well be left in, or planted to, shrubs. The recommendations are made not only in the interest of wildlife but also in that of orderly and productive farming.

Management: Planting for wildlife and erosion control

Hawbecker, A. C. Planting for California wildlife, California Fish & Game (Terminal Island, Calif.), 26(3), July 1940 (rec'd. October), pp. 271-276, Figs. 100-103.

Food and cover plants essential to wildlife have been depleted in many areas but they can be restored to the advantage of both wildlife and soil conservation. An eroded farm near Watsonville, Calif., was planted and the California quail reintroduced. From 7, their number rose in two years to 47, without predator control and with some hunting. Other kinds of wildlife also were benefitted. The plants most successfully used, and animal species present on the farm before (12) and after (30) planting, are listed.

Management: Planting for wildlife and soil conservation

Anon. More abundant wildlife through the AAA program, U. S. Dept. of Agriculture, Agricultural Adjustment Administration (Washington, D. C.) General Information Series, G-100, folding circular, 6 pp., 7 photos, June 1940 (rec'd. August).

Notes on the interest and value of wildlife to farmers and the relation of soil conservation practices to wildlife. Payments are available to farmers for practices that help wildlife conservation under the 1940 program of the AAA, as follows: "(1) Farmers who plant, replant, cultivate, protect, and improve forest trees or mixtures of forest trees and shrubs suitable or beneficial for wildlife or for the protection of wildlife may be paid $3 to $7.50 per acre; (2) farmers who seed permanent grasses or permanent pasture mixtures under AAA specifications may be paid $3 per acre; (3) farmers who establish a

permanent vegetative cover by planting crowns of Kudzu may receive $6 per acre; (4) farmers who allow nature to reseed noncrop open pasture by nongrazing during the normal pasture season under AAA specifications may receive $1.50 per acre." Other practices beneficial to wildlife, carried on under separate parts of the program, also are mentioned.

Management: Pond development

Osborn, Ben. Native plants stabilize pond shores, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 6(6), Dec. 1940, pp. 144-145, 1 photo, 1 map.

By protecting native plants around a pond in Oklahoma for three seasons, the shores and inlet channel were completely stabilized. The only planting was sodding of the dam and spillway with Bermuda grass. The cover that developed is described. It attracted red-winged blackbirds, meadowlarks, mourning doves, and other birds.

Management: Squirrel, Gray

Goodrum, Phil. D. A population study of the gray squirrel in eastern Texas, Texas Agr. Expt. Sta. (College Station), Bul. 591, 34 pp., 5 figs., 6 tables, 1940.

The squirrel population has been reduced since about 1910 by overshooting and by the effects of lumbering. Methods found most effective in estimating numbers of the animals were: "(1) Time-area counts of the number of squirrels on sample plots selected at random over the tract to be censused; (2) counting leaf and twig nests on a given strip of forest cover of different types, preferably in late fall and early winter; (3) hunting with a dog." The nest count method recommended as practicable for game management purposes. Summaries of counts made in different types of habitat are tabulated and the carrying capacity shown to be highest in hammocks or loamy ridges on flood plains. Average populations varied from 1.14 to 1.34 squirrels per acre. Life history, including food habits, and local movements are discussed in relation to management. The animals breed throughout the year, hence any shooting season will coincide to some extent with the reproductive period. The young remain in vulnerable groups for about 4-1/2 months. Unrestricted timber cutting, overgrazing, and drainage, all have contributed to the reduction of the numbers of squirrels. Suggestions are made for modification of each of these activities that will improve conditions for squirrels. The population can be approximately doubled. Bibliography of 22 titles.

Management: Stocking, cottontail

Cramer, Wilbur M. Pennsylvania's rabbit transfer program, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(7), Oct. 1940, pp. 6-7, 27, 5 figs.

Continuation of an article of same title abstracted in WILDLIFE REVIEW, No. 28, August 1940, p. 36. This installment relates mainly to the trapping of

rabbits in parks, and upon institutional and other grounds where hunting is not permitted; animals are also taken from nurseries, truck gardens, and other places where they do damage. The most dependable sources, however, are auxiliary game refuges. A tabulation of the head of game trapped on one of the most productive areas shows that 5,884 rabbits and 1,588 pheasants were removed in 8 years. In the fiscal year 1939-40, more than 30,000 cottontails were trapped and redistributed at a cost of about 50 cents each. The number taken from various areas and the acreage per rabbit removed are recorded in a table; acres per rabbit varied from 0.35 to 2.35.

Management: Turkey

Mosby, Henry S. Restoring the wild turkey in Virginia, Virginia Wildlife (Virginia Commission of Game and Inland Fisheries, Blacksburg. 10 cents a copy), 4(1), Autumn 1940, pp. 11-15, 1 photo.

Notes on the history of the wild turkey; the bird received no effective protection until 1916. The species still occurs in 69 of the 100 counties, to the total number of about 23,000 in 1937. Restocking with purchased stock proving ineffective, the Commission set out to develop a satisfactory procedure. Elements of it are mating of selected brood hens with native wild gobblers and releasing birds four months of age in groups of 15-20. Fifty percent survival is considered satisfactory. The propagated birds are liberated on unoccupied territory; for the older range, improved management and adequate protection are relied upon to keep up the stock. Education is the only hope for conservation.

Natural History: Birds of Ohio

Rorimer, Irene T. A field key to our common birds, Cleveland Mus. Nat. Hist., Pocket Natural History No. 8 (Cleveland, Ohio. $1.50 a copy), 158 pp. (4-1/4 x 6-3/4), 19 pls. (4 col.), 28 figs., Nov. 1940.

Relating especially to the common birds of northern Ohio, but of broader application, this pocket manual includes keys, illustrations, and descriptions, and also remarks on status and habitat. An appendix comments on uncommon species grouped according to the environments in which they are most likely to be seen.

Natural History: Birds of Texas

Burleigh, Thomas D., and George H. Lowery, Jr. Birds of the Guadelupe Mountain region of western Texas, Louisiana State University (University, La.) Occasional Papers, 8, Aug. 1940, pp. 85-151, 4 pls., 1 map.

General description of the region and of the field work reported and annotated list of 177 forms of birds.

Natural History: Cacti of Arizona

Benson, Lyman, J. J. Thornber, A. A. Nichol, and Lucretia B. Hamilton. The cacti of Arizona, University of Arizona, Biol. Sci. Bul. 4 (Tucson, Ariz. $1.00 a copy), 134 pp., 52 pls. (including several in natural colors, and numberous bicolored distribution maps), 1940.

A wonderfully good publication on a group of plants for a State, excellently presented and effectively illustrated. It includes all general information, keys and illustrations necessary for identification of the 80 species native to Arizona, gives description, statement of range, and remarks for each form, and contains a section on the culture and care of cacti.

Natural History: Mammals of Texas

Davis, Wm. B. Mammals of the Guadalupe Mountains of western Texas, Louisiana State University (University, La.) Occasional Papers, 7, July 1940, pp. 69-84, 1 map.

Notes on vegetation and physical features of the region. Annotated list of 32 forms of mammals.

Natural History: Wildrice

Chambliss, Charles E. The botany and history of Zizania aquatica L. ("wild rice"), Journ. Washington Acad. Sci. (Wm. P. Diehl, U. S. Bureau of Plant Industry, Washington, D. C. 50 cents a copy), 30(5), May 15, 1940, pp. 185-205, 6 figs. (photos).

Utilization of wildrice by wildlife is given all the mention that might be expected in a popular general account of the plant which covers vernacular names, early records, distribution, structure, life history, and harvesting, and recites some of the Indian lore about the plant.

Predation: "Vermin" problem

Netting, M. Graham. Reptiles killed on a "vermin" campaign in Mercer County, West Virginia, Proc. W. Va. Acad. Sci. (Charleston), 13, 1939, pp. 162-166.

Identification of 1 species of lizard and 5 of snakes from 37 specimens upon which bounties had been paid. Discussion of the food habits and economic values of the forms and a plea for "vermin" campaigners "to stay their hands from those species of animals that serve as insect and rodent controls."

Predators: In Canadian national parks

Halliday, W. E. D. Nature's wise law of survival, Forest & Outdoors (610 Canada Cement Bldg., Montreal, Canada), 36(10), Oct. 1940, pp. 317-318, 324, 326, 329.

Principally an exposition of changing policies toward predators in Canadian national parks. At first wolves and bears were specified for control in legislation; then interest in the preservation of the grazing animals became predominant and all the larger predators were combatted by a variety of methods; more recently policy has come into "general agreement with that officially stated by the United States Government for the National Parks Service. It is recognized that these animals are part of a well-defined scheme of relationships between all forms of wild life, and that they provide a natural and necessary check on the abnormal increase of other forms, especially on the surplus population of herbivorous animals. It is believed that the ultimate good of animal populations protected from man is best obtained by, in general, non-interference with the natural struggle for existence. It is also felt that the handling of wild life on the principles applicable to domestic livestock is to be avoided. It is fully appreciated that a certain degree of control may be necessary from time to time, for protection of property, domestic herds, human life, or to aid an animal species in danger of extermination. Such control, however, must be flexible, and easily adjusted to varying needs." Each of the principal predators in Canadian national parks is briefly discussed and in no case is systematic control at present deemed necessary. Instructions to wardens on this point are quoted in illustration of the official policy.

Propagation: Feeding pheasants

Skoglund, Winthrop C. Self selection of fall and winter foods by ringneck pheasants, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 11(7), Oct. 1940, pp. 14-15, 28, 3 photos, 5 tables.

Comparison of the results of feeding a definite grain-mixture and of a free-choice ration of the same materials plus soy beans. Birds allowed to regulate their own diet ate the soy beans well and took the ingredients of the grain mixture in proportions different from those of the standard mixture. However, slightly better results, as measured by growth, feed consumption, and efficiency, were obtained with birds fed the recommended diet.

Propagation: Feeding young pheasants

Skoglund, Winthrop C. An improved ration for starting ring-necked pheasants, Pennsylvania State College, Expt. Sta. (State College) Bul. 389, 22 pp., 4 figs., 13 tables.

Abstract of previous research as to protein requirements of young birds. Neglect in feeding results in losses from perosis (slipped tendons). The history of prevention of this difficulty in young chickens is reviewed and the work upon pheasants recounted. Of 10 starting rations experimented with, one containing soy bean oil meal as the major source of protein was found satisfactory and practicable. Its formula is given in full. Bibliography of 31 titles.

Propagation: Hybrids

Hachisuka, -------. The hybrid pheasants, Modern Game Breeding (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa. 25 cents a copy), 10(8), Aug. 1940, pp. 6-7, 10-11, 2 photos.

Notes on the following crosses: Guinea fowl X domestic fowl; guinea fowl X peafowl; vulturine X common guinea fowl; common pheasant X turkey; Indian X green peafowl; peafowl X domestic fowl; golden X Lady Amherst pheasant; golden X common pheasant; Reeves' X common pheasant; kaleege pheasant hybrids (several); and the Manchurian X blue eared pheasant;

Research: Animal containers

Bissonnette, Thomas H., and Earl E. Bailey. Den and runway system for weasels and other small mammals in the laboratory, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 24(3), Nov. 1940, pp. 761-763, 1 fig.

Description and illustration of cages and runs adapted to hold small, quick animals that escape at the slightest opportunity. The containers are built to use in series and to be moved about on castered supports.

Research: Mammal

Hamilton, W. J., Jr. Mammal life of the forest floor, Bul. New York Zoological Society (Publication Office, Zoological Park, New York, N. Y. 35 cents a copy), 43(6), Nov.-Dec. 1940, pp. 171-180, 12 illus.

Interesting popular article on the environment and its mole, shrew, and mouse inhabitants, intended as an encouragement to their study.

Research: Marking animals

Koelor, Clyde E. Tatoo [sic] punch for numbering rats, Science (Lancaster, Pa. 15 cents a copy), 92(2383), Aug. 30, 1940, pp. 205-206, 2 figs.

Illustration of home-made punch and description of its use; capacity up to a million numbers.

Research: Marking animals

Trippensee, R. E. A new type of bird and mammal marker, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 5(1), Jan. 1941, pp. 120-124, 1 pl., 2 tables.

Author's abstract: "Pyralin markers obtainable in nine colors may be fastened to the tail-feathers of birds and the ears of small mammals. The purpose of the markers is to distinguish individuals so as to facilitate observations on them without trapping. The colors found most effective are white,

black, yellow, maroon, orange, red, cerise, dark-green, light-blue, and dark-blue. Seventy-two different color combinations can be made from available material. Different-sized markers are used for pheasants, ruffed grouse, song-birds, rabbits, and squirrels. Marked snowshoe hares have been distinguished up to 60 feet and pheasants up to 300 feet. The method of using the markers is described and a summary of their limitations is given." Bibliography of 8 titles.

Research: Methods of analyzing feces

Swenson, Gustav. Food habits of the sharp-tailed grouse by analysis of droppings, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 432-436, 1 table.

Author's abstract: "The analysis of droppings as a method of determining food habits of gallinaceous birds deserves wider application, although it has a tendency to exaggerate the importance of the harder items. Review of the chief literature on food habits of the carnivorous mammals determined by this method reveals a lack of uniformity in presentation of data. It is suggested that frequency of occurrence, volumetric data, and number of prey individuals should all be presented wherever possible to facilitate comparison with other studies. All published reports upon the autumn and winter foods of the sharp-tailed grouse reveal that the diet is relatively simple."

The leading 3 food items by volume in 550 droppings were bearberries, rose hips, and wild buckwheat.

Research: Trapping squirrels

Baumgartner, Luther L. Trapping, handling, and marking fox squirrels, Journ. Wildlife Management (Frank C. Edminster, Soil Conservation Service, Upper Darby, Pa. 75 cents a copy), 4(4), Oct. 1940, pp. 444-450, 1 pl., 16 figs.

Description and illustrations of the trap found most efficient in the capturing alive of some 1,100 fox squirrels; also similar material with reference to a handling cage. Instructions for trapping squirrels and marking them by tags and by toe clipping.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C.

BS-164. Research in the administration of Federal refuges, by E. R. Kalmbach, 7 pp., June 1940.

Calls attention to Federal obligations imposed by treaties and legislation for the protection of waterfowl and to the desirability of research as a basis for management. Allusion is made to studies of aquatic plants but most of the leaflet is devoted to an account of work with predators in relation to nesting waterfowl. Control as thus far carried on is regarded as part of the experimental work and the policy of doing the least necessary to optimum production of the protected birds is recommended.

170. The annual fur catch of the United States, 21 pp., 40 tables, October 1940.

Compilation of data of varying degrees of completeness from Alaska and 39 States, in most instances representing more than one year.

172. Suggestions for combating objectionable roosts of birds with special reference to those of starlings, by E. R. Kalmbach, 18 pp., 1 pl., December 1940.

History and status of the starling in America; description of its roosting habits, their objectionable features, and means of control, including screening, eliminating roosting ledges, trimming trees, and frightening the birds, and also shooting, trapping, gassing, and poisoning. Six references to cognate articles. Supersedes BS-81, issued in 1937.

174. Abstract of fur laws, 1940-41, compiled by Frank G. Grimes, 39 pp., October 1940.

Open seasons, and the stipulations regarding possession and sale, shipment and export, and licenses for taking furs and fur animals are set forth for Alaska, Canadian Provinces, and the United States. The application of the Federal Lacey Act to interstate shipments also is explained.

BS-175. Big-game inventory of the United States, 1939, 11 pp., 17 tables, November 1940.

Tabulations for 13 species according to States, for 15 according to the ownership or control of their ranges, and summary for 14 species. Total nearly six millions.

NOTES AND NEWS

On October 12, 1940, plenipotentiaries of six Latin American governments and the United States signed the convention on "Nature Protection and Wildlife Preservation in the Western Hemisphere" when it was deposited and opened for signature at the Pan American Union in Washington.

The Convention was drawn up by a Committee of Experts from the 21 American Republics, which met in Washington May 13 to 16, and was approved by the Governing Board of the Pan American Union at its June meeting. The formulation of the Convention was recommended in one of the resolutions of the Eighth Pan American Conference, held at Lima, Peru, in December, 1938.

The Convention consists of twelve articles. Article 1 defines the terms used in the Convention. Under Article 2, the contracting governments undertake to create national parks, national reserves, nature monuments, and wilderness reserves within their territories as soon as possible. They are to notify the Pan American Union of the establishment of any such parks, etc., and of any legislation adopted in connection therewith. Under Article 3, the governments agree to prohibit the destruction of the fauna and flora in national parks except under the direction or control of the proper authorities. Wilderness reserves, according to Article 4, are to be kept inviolate except for duly authorized scientific investigations or government inspection.

Under Article 5, the governments pledge themselves to adopt legislation which will assure the protection and preservation of the natural scenery, striking geological formations, and regions and natural objects of aesthetic interest or historic or scientific value. Cooperation among the contracting governments in promoting the objectives of the Convention is provided for in Article 6, and the adoption of appropriate measures for the protection of migratory birds, in Article 7.

Article 8 declares the protection of certain species to be of special urgency and importance and urges that permission for their killing, capturing or taking, be granted only in order to further scientific purposes. Rules for the regulation of the importation, exportation and transit of protected flora and fauna are set forth in Article 9. Articles 10, 11, and 12 deal with protocolary matters, and stipulate, among other things, that the Convention will come into force three months after the deposit of not less than five ratifications with the Pan American Union.

An article by Harold J. Coolidge, Jr., bearing on the treaty may be found in Science, 92(2394), Nov. 15, 1940, pp. 458-460.

The reports on wildlife surveys made by the Colorado Game and Fish Commission (Denver), while administrative in function and to a considerable extent in content, nevertheless, treat numbers, range, life-history, food habits, and relations to man and to predators to such an extent that they are valuable for reference. Those reaching WILDLIFE REVIEW relate to the beaver (2 vols.), antelope, deer and elk (2 vols.), and sage grouse (all mimeographed).

Proceedings of the Second Minnesota Wildlife Conservation Short Course (Minnesota Wildlife Federation, Minneapolis), 70 pp. (mimeographed), 1940. Introduction and briefs of 18 papers presented during the course under the leadership of Gustav Swanson. Those coming within the scope of WILDLIFE REVIEW are here briefly abstracted.

Lincoln, Frederick C. Management of migratory waterfowl, pp. 3-6. Causes and progress in the decline of waterfowl; improved regulation of hunting and a vast refuge program, under more favorable climatic conditions reversed the trend and in 5 years resulted in doubling of the numbers of the birds.

Stoudt, Jerome. The waterfowl population in the Chippewa National Forest, pp. 6-9.

Summary of censuses for 3 years 1937-9; the number of ducks fluctuated in proportion to the total length of shoreline which was controlled by water levels at a dam. Total populations of the Forest for the years noted and the proportions composed of various species are estimated (mallard, blue-winged teal, and golden-eye most common). Breeding areas are much understocked. The kill was greater than the total breeding population each year--2-1/2 times as great in 1939. Additional protection has been given by the establishment of 7 refuges totaling 8,700 acres (3 percent of the water area of the Forest).

Gigstead, Gill. Homes for tree-nesting ducks, pp. 9-11.

Nest boxes have been well accepted by wood ducks in Illinois and golden-eyes in Minnesota. Directions are given for building and placing the houses. The numbers of tree-nesting ducks may have been greatly affected by lumbering operations.

Nagel, Werner O. The chukar partridge and other introduced game birds, pp. 12-13.

Of 86 species and subspecies of birds introduced from 1870 to 1930, only 5 became well established. Two of these were game birds, the Hungarian partridge and ring-necked pheasant. Game-farm production of these birds for shooting is impossibly expensive, so in the long run they must be managed on the same basis as native game. Ecological studies should be relied upon as a guide to satisfactory areas for stocking. Studies in Missouri indicate that the State has no range upon which it appears likely that chukars will set up a stable, general, and self-supporting population.

Aldous, Shaler E. The beaver in Minnesota--a resource and a responsibility, pp. 14-17.

After great depletion, beavers, under protection, increased generally in the northern part of their range. In Minnesota, despite poaching, their population grew until in 1939 an open season was permitted, in which some 11,000 of the animals were taken. Suggestions are made as to improving the season with a view to maintaining the population and providing a regular crop of from 5 to 8 thousand pelts. The life-history, with special emphasis on food habits, is sketched and 9 questions about beavers much in need of adequate answers are propounded. The answers are needed as a basis for progressive management.

Swanson, Gustav. Pheasant management in Minnesota, pp. 17-20.

Though the pheasant has been very successful in the State, need for improved management arises from the steadily increasing number of hunters. A dependable census is a requirement for good management. Methods of enumerating the birds are described and management suggestions are made.

Moyle, John B. Planting aquatic plants in Minnesota lakes and streams, pp. 29-32.

As a direct food resource for ducks and geese and as an indirect one for fishes. The main factors influencing the distribution and abundance of aquatic plants are: The chemical quality of the water; the physical nature of the body of water; the type of bottom soil; the abundance of plankton; and the effects

of feeding by animals. Plants are named that are suited to waters of 3 different degrees of "hardness" and of 5 combinations of these types. Similar suggestions are made also with respect to the other limiting factors. The environmental qualifications that should be ascertained in pre-planting surveys are listed.

Hatfield, D. H. Minnesota fur-bearers--an undeveloped asset, pp. 32-36.
On about 40 percent of Minnesota's land that is unsuitable for agriculture, income from fur is, or can be made, important. The chief fur animals, and their distribution, abundance, and values are discussed and examples of income from trapping and sale of furs are cited. The net effect of the food habits of fur-bearers is held to be beneficial to farmers and sportsmen alike. Research as a basis for management is needed and desirable investigations are pointed out. It may well be supported by the fur industry. Trappers should be educated and poachers controlled.

Frodine, Gordon. Minnesota's deer problem, pp. 36-42, 2 tables.
See abstract on page 46 of this issue of WILDLIFE REVIEW.

Fenstermacher, R. Autopsy findings of deer, pp. 42-43.
Summary of 102 autopsies as to the finding of bacteria, ecto- and endoparasites, and as to mechanical injuries and other causes of death, including malnutrition.

King, Ralph T. Upland game--its future and management, pp. 55-62.
The period of settlement, bringing great interspersion of clearings, croplands, and forests, and multiplication of "edge" environment, was also one of great increase in farm game. Then more intensive farming, growth in the number of hunters, and increase in accessibility to game environments, brought on depletion. New methods of treating wildlife are necessary, including possibly restrictive, and certainly productive, measures, that is, management. Wildlife reproduction is so exuberant that almost any efforts at management are rewarded. They are most effective when guided by the requirements of the species involved, particularly in the breeding season. Attention to year-round needs is, however, necessary. Provision of food and cover in proper relationship, inventory of stock, and restriction of the kill to surpluses, are essential. Much restocking is wasted because nothing can be gained by adding game to a range which cannot support that already present.

King, Ralph T. The sportsman's part in conservation, pp. 63-70.
Conservation is defined as use guaranteeing maintenance. Conservation of wildlife requires maintenance of productive environments. It is justified by commercial, recreational, biological, social, esthetic, and scientific, values which are exemplified. Due to the variety of these values, many groups of people are interested and are entitled to share in conservation management. The proper role of the sportsman is discussed at some length and summarized in the following paragraph:

He should: "(1) Recognize and appreciate the rights and interests of all other conservation minded groups and keep constantly in mind the various values possessed by and services performed by our wealth of wild species; (2)

distinguish between policy and program; decide matters of policy but leave matters of program to those charged with the responsibility of carrying it out; (3) foster and promote management by devising some means of compensating the landowner for his investment in management; (4) recognize and appreciate the landowner's position and enforce this same recognition and appreciation on the part of his fellow sportsmen; (5) take the steps necessary to insure the proper utilization of wildlife; (6) aid in the production of wildlife by accepting proven practices and seeing that they are properly applied."

The annual report of the Ohio Wildlife Research Station (Ohio State University, Columbus, 14 pp. mimeographed, 1940) for the fiscal year 1939-40 lists the staff, substations, and students, explains the work in progress and that finished, and records the positions held by 28 men formerly associated with the station, 27 of whom are employed in the field for which trained.

In the October, 1940, issue of Timely Turf Topics of the United States Golf Association Green Section (Box 73, Benjamin Franklin Station, Washington, D. C.) is discussion of possible injury to birds from arsenical poisoning of turf pests. From its experience, which is summarized, the Green Section concludes that arsenical treatments of turf can be carried on without introducing any menace to the bird population.

There has been a tendency for the issues of WILDLIFE REVIEW to appear with less frequency but to contain more numerous abstracts. This appears from the subjoined table.

Years	Number of issues	Average number of abstracts per issue*
1935-36	7	89.4
1937-38	11	91.5
1939	7	112.0
1940	3	157.0

*Excluding indexes

Convenience has in part influenced this trend but the compiler will be glad to learn the views of readers as to whether larger and less frequent, or smaller and more frequent, issues are desirable.

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